Proposed Environmental School
Place-based, Imaginative and Ecological Learning

1. Introduction

This project is focused on preparing students for a future in a sustainable and ecological world. It fully epitomizes the School District vision, mission, and values, and embraces the principles of learning. The project's different approach to schooling demonstrates the many concepts of educational change that are truly woven together where there is a community of learners:

- Students will learn in place, experientially, and in context
- Students are engaged through inquiry, project based learning, and critical thinking
- Changes the focus of learning beyond simply content to developing learners' deeper understanding
- Develops learners' self-efficacy and cognitive tools to flourish in creativity, innovation and imagination
- Encourages community relationships and engages the whole community as collaborators in learning
- Embeds research into the fabric of learning/teaching development, assessment and accountability
- Promotes collaborative learning: Students, parents, educators, community and researchers working together
- Educators become facilitators and guides, as well as teachers
- Technologies will be used as a critical tool for investigation and as a way to demonstrate learning

2. History:

Development

For the past 2.5 years a team has been working with parents, local educators, community organizations, the municipality and members of the school district to fully develop another option for "schooling", with a focus on experiential, hands-on, and in context learning. This project originated with grass roots conversations about teaching and learning and continued to grow with support through school district initiatives, SFU input, and community involvement. Through this interconnected and interdependent support and the initiatives, such as, Superintendent Jan Unwin's "End of Teaching Everything", the support from the SFU eCURA grant and the community, this type of schooling will form another option for students who flourish in this learning environment.
(For a complete overview of the developmental stages and history, see Appendix 1.)
(For the Simon Fraser University Social Sciences and Humanities research Council, Community University Research Alliance, Environmental Call (eCURA) Letter of Intent, see Appendix 2.)

Communication and Forums

There has been a great deal of communication and forums regarding Place-based, imaginative and ecological schooling, from local to national and international. Extensive communication activities have been accomplished, and communication continues as an ongoing process with the diverse group involved in this project. The collaboration and communication to move this

project forward has involved community, educator, and collaborator dialogues, numerous meetings, public and parent presentations, a brochure, and social networking through email, and online news letters.
(For a list of Communication activities and forums see Appendix 3.)

Community Partners / Collaborators

The following community partners have continuously been actively involved in the growth of the project:

- Katzie First Nation
- Kwantlen First Nation
- Simon Fraser University
- School District 42: Maple Ridge & Pitt Meadows
- District of Maple Ridge
- Maple Ridge and Pitt Meadows Parks and Leisure Services
- Metro Parks Vancouver
- Kanaka Education &Environmental Partnership Society (KEEPS)
- BCIT Woodlot
- Blue Mountain Woodlot
- Malcolm Knapp Research Forest (University of British Columbia)
- Haney Horseman Association
- Community Education on Environment and Development (CEED)
- Alouette River Management Society (ARMS)
- Golden Ears Transition Initiative(GETI)
- The ACT Arts Centre and Theatre
- Maple Ridge Museum and Historical Society

Parents

A number of parents are excited about the possibilities of this initiative and with the potential for their children to have personalized learning in an experiential manner.

- ~ 25 parents regularly participating in information sessions
- Environmental School Project Survey
    - 102 participants – 85 yes; 14 more information
    - 14 participants from outside of district
- 96 parents on listserv

(For further information regarding community support, see Appendix 4)

3. Proposal:

The Environmental School Project seeks to build and study an alternative model of environmental education in the community of Maple Ridge, BC. This approach to learning and teaching aligns with the school district's, the municipality's, our community's, and the province's vision for education.

- The Maple Ridge-Pitt Meadows School District's Mission, Vision and Values reflect these educational needs:

    a) respect the uniqueness of each individual using a variety of instructional methods to build community and individual capacity;

b) encourage diverse learning opportunities beyond the classroom in a holistic approach;
c) set high expectations to build community and personal successes;
d) develop a sense of belonging through personal engagement, leadership and citizenship; and
e) encourage interdependency through community partnerships.

- The District of Maple Ridge is widely regarded as a leader in sustainability initiatives in the province. In 2007, the District Council reshaped its long-term Strategic Plan "to address not only environmental sustainability, but also social and economic sustainability." With these guidelines, they are participating in a variety of activities that encourage different educational possibilities.

- Our community has many individuals and organizations that are concerned about ecological sustainability and who have shown a desire to partner together with each other and the school district, in order to share their knowledge with learners. There is the sense that our community wishes to reconnect, to continue improving relationships with partners and public in order to improve student learning.

- The Ministry of Education continues to encourage personalized learning and empower learners to strengthen foundational skills, develop deeper understanding and knowledge, be innovative, and use technology. This means that education can go beyond learning outcomes and include an emphasis on critical thinking, communication, collaboration, and creativity.

Taking the provincial and local visions as a starting point, the local school district (School District 42), the community of Maple Ridge and researchers in the Faculty of Education at Simon Fraser University (SFU) will work together to develop an environmental school, in which learning across the curriculum is tied to the growth of environmental awareness, engagement with the natural world, and community sustainability.

We believe that SD42 has an incredible opportunity for developing an Environmental School that will establish a model of provincial and even national significance. Closer to home, it will contribute to providing our students with a meaningful education and our parents, community, and educators with a broader capacity and range of choices.

Project description

The Environmental School's guiding principles will use five interwoven, pedagogical strands while working directly with students, parents, and collaborators to allow learners to be engaged in place, in context and experientially. Inquiry, imagination, sustainability, inclusion, and place-based education are key concepts behind Environmental School's philosophy and teaching/learning.

(For further information on educational merits, research or cite models of "best practice" and a short-list bibliography and literature review, see Appendix 10)

Goals

The educational goals of this project will involve the learner in experiential activities, hands-on and in context, to improve student engagement and success. In the particular environments of Maple Ridge, learners will engage in many learning opportunities and develop skills and knowledge for a sustainable future. In the culture of inquiry and through project-based activities, learners will

- Reconnect with the natural world: think ecologically
- Build relationships: social justice, community
- Critically think and problem solve: reflect, research – access information, , analyze, synthesize, critique, evaluate and create new knowledge
- Collaborate: social, community, networks
- Adapt: be flexible, understand change, live with uncertainty, take risks, build resilience
- Innovate: initiate, imagine, create
- Communicate: somatically, orally, written
- Be creative: curiosity and imagination
- Integrate technology

Curriculum

The Provincial Guidelines for curricular areas and the learning outcomes will be integrated into the themes, projects, and activities of place-based, imaginative and ecological schooling: Place-based Education, Imaginative Education, Inquiry Method, Inclusion, and Environmental Education (see Appendix 5 for more details of the five interconnected strands). Organized themes, projects, and activities meet a multitude of skills, strategies, cognitive tools, and learning outcomes, especially as they are connected to personalized learner development and the project's goals.
(Examples of possible activities are in these appendices: Appendix 6, Theme stories of three locations; Appendix 7, A day – theme and activities for two different areas; Appendix 8, Extended themes and schedule; and Appendix 9, A possible "Year Theme and Plan.)

Assessment and Reporting

The project will provide assessment and reporting as per the provincial guidelines: 3 formal and 2 informal reports; assessment for, as, and of learning; and parent involvement. In addition, assessment and reporting will include

- Progressive assessment: personalized plans; progress
- Portfolio
- Alternate forms of knowledge presentation: use of technologies, oral, written, video, photographs; building, creating, designing
- Student, parent, and community involvement
- Research assistance with different ways to assess and report

Whom the intended program would service (student profile)

K – 7 Students
An inclusive plan
Choice school: open boundaries

Registration and acceptance process

Attendance at orientation sessions
Completion of registration form
Family interview
Understand and agree to project philosophy and guidelines

Safety considerations for project participants

- education: information sessions and workshops for philosophy and training
- criminal record checks
- volunteer forms
- ethics dialogue
- participation/release forms
- clear boundaries and safety considerations for specific locations and activities

Staffing: needs, sustainability, implications

- Staffing established by district formula and student numbers
- Educator Network (2008, 2009, 2010, with support through SFU eCURA grant and School District #42 JESIC)
- Educator Certification (beginning Fall, 2010, through SFU)
- SFU Faculty of Education: under discussion a Master's of Place-based, Imaginative and Ecological Education (Possible for Summer, 2012)
- Conversations with MRTA and CUPE in process

Location

At this point in time discussion is under way as to options for the project's home-base location. These include "school within a school", "school beside a school", and/or use of a community facility. Commitment to a home-base location will become more firm with confirmation of the project. Beyond a base location, students will be engaged in activities in a variety of locations in the community, such as parks and community buildings.

Financial considerations: student fees, sustainability, budget

- Student fees
    - Not additional, may be subject to same fee structures as other programs regarding different or special school supplies (i.e., rain gear)
- Simon Fraser University, Social Sciences and Humanities Research Council, eCURA Grants ($1,000,000+)
    - Support through Research: professors, doctoral students, ethnologists, curriculum designers, community research connections
    - .5 VP/coordinator position for school year 2010/2011; .25 for school year 2011/2012
    - Educator network, workshops, training, and certificate program
- Support from community connections grant, $10,000 toward program coordination
- JESIC support for educator network
- Applications for additional grants and financial support are ongoing
- Additional funding due to "new to district" students

An outline of the implementation timeline

- November, 2010, approval by SD42 Board of Education
- January – August, 2011: Organization and preparation; council formation; continued community involvement; planning; staffing; continued grant and funding investigation
- February, 2011: Registration planning and process
- September, 2011: Formal place-based, imaginative and ecological "schooling" opens

Evaluation plan (connect to sustainability of program)

- Simon Fraser University connection and research
- Community input and dialogue
- Council (Hearth Keepers) input and dialogue
- Continued stakeholder involvement: students, parents, educators, collaborators

Appendix 1

ARCHIVE OF MEETINGS AND EVENTS FOR MAPLE RIDGE'S ENVIRONMENTAL SCHOOL PROJECT

"Place-based, Imaginative and Ecological Education"

Note: These archival notes many contain activities centered in Maple Ridge and directly relating to the Project Coordinator. There are many activities, meetings, conferences, dialogues and conversations that have undergone between parents, interested individuals, teachers, researchers, collaborators, government officials, and a variety of organizations within and beyond Maple Ridge.

May, 2008: Jodi Macquarrie, SD42 Teacher and SFU Doctoral student, and Clayton Maitland, SD42 VP question teaching and learning based observations, learning principles, post-Vygotskian Theory, Experiential Theory, Ecological Theory and more .

July 2, 2008: SFU Faculty Dr. Sean Blenkinsop, VP SD42 Clayton Maitland, SFU doctoral students Jodi MacQuarrie and Michael Caulkins and UBC doctoral student Nora Timmerman meet, "seeking thoughts and feedback on some programming, implementation, evaluation and research ideas for an environmental/ecological learning center."

September 18, 2008: Dr. Sean Blenkinsop passes along Social Sciences and Humanities Research Council of Canada (SSHRC) special call announcement to Clayton Maitland and Jodi MacQuarrie to see if interested in applying for a research grant.

October 7, 2008: Clayton Maitland and Jodi MacQuarrie get together with a group of teachers (Cezann Duveaux, Mike Ross, Catherine Dixon, Susan Maitland, Mario Beaulieu, and Dale MacQuarrie) WhiteSpot Restaurant to talk about learning and teaching differently.

October 14, 2008: Meeting at Frogstone Grill to discuss possibilities and potential for looking at learning and teaching differently, in a more experiential and place-based manner (City of Maple Ridge Environmental Planner Rod Stott, Gail Szotek, Neighbourhood Development Coordinator Christine DiGiamberardine, SFU Education Faculty Drs. Mark Fettes, and Sean Blenkinsop, SD42 VP Clayton Maitland, SD42 Teacher and SFU Doctoral student Jodi MacQuarrie, SD42 Aboriginal Education Principal Doug Hoey, and SD42 Principal Trevor Connor.

October 30, 2008: Meeting at City of Maple Ridge District Office (City of Maple Ridge Environmental Planner Rod Stott, Youth Coordinator Tony Cotroneo, Youth Services Programmer Brian Patel, Gail Szotek, Neighbourhood Development Coordinator Christine DiGiamberardine, Director of Community Services Sue Wheeler, SFU Education Faculty Drs. Mark Fettes, Sean Blenkinsop, and Gillian Judson, SD42 VP Clayton Maitland, Teacher and SFU Doctoral student Jodi MacQuarrie, SD42 Superintendent John Simpson)

November 5, 2008: Research team meets at SFU

November 18, 2008: Draft of SSHRC eCURA letter of intent (LOI) goes out to major partners and core research team for final feedback and review. Letter of Intent is subsequently submitted, accompanied by letters of support from Chuck Goddard (Manager of Environment and Development Services, District/Municipality of Maple Ridge); John Simpson (Superintendent, School District 42); Dr. Doug Hoey (District Principal, Aboriginal Education); Suzanne de Castell (Acting Dean, Faculty of Education, Simon

Fraser University); and Michael Stevenson (President, Simon Fraser University).

November 20, 2008: Meeting at Katzie First Nation Band Office to talk about Environmental School Project (Katzie Education Councilor Donna Leon, SD42 Aboriginal Education Principal Doug Hoey, SD42 VP Clayton Maitland)

April 3, 2009: Dr. Sean Blenkinsop receives official confirmation from SSHRC that the Letter of Intent for this project has been funded ($20,000.00)

April 10, 2009: Agricultural Meeting, Investigation of agricultural needs in Maple Ridge for project based opportunities (SD42 VP Clayton Maitland).

April 11, 2009: Environmental Meeting, Investigation of environmental needs and mapping in Maple Ridge for project based opportunities (SD42 VP Clayton Maitland).

April 15, 2009: Research team meets at IERG Office to discuss next steps and needs. Mark Fettes records meeting on his laptop. Brochure of proposed environmental school is developed, webpage and survey ideas brainstormed.

April 22, 2009: Superintendent John Simpson receives brief of project, prepared by Clayton Maitland.

April 24, 2009: Research team is advised by Simpson of receipt of brief and instructed by him that "expanding program options" policies will guide next steps.

April 29, 2009: Superintendent John Simpson shares brief of project with school district senior team and Board.

May 14, 2009: Superintendent John Simpson, Assistant Superintendent Jan Unwin, Clayton Maitland and Jodi MacQuarrie meet to discuss project

May 20, 2009: Meeting with Maple Ridge Teachers' Association to discuss the project Attendance: MRTA President Drusilla Wilson, MRTA Vice-President George Serra, Jodi MacQuarrie, Clayton Maitland

May 22, 2009: Research team meeting at SFU to organize and plan project (Sean Blenkinsop, Mark Fettes, Clayton Maitland, Jodi MacQuarrie).

May 28, 2009: Meeting with Education Committee, School District 42 (Jan Unwin, Eleanor Palis, Susan Carr)

Also attending: Sean Blenkinsop, Mark Fettes, Clayton Maitland, Jodi MacQuarrie (See June 2, 2009 email for meeting minutes)

June 5, 2009: Meeting with MRPVPA (Maple Ridge Principals and Vice Principals Association. Attending: Bruce Grady (President), Shannon Derinzy (Vice-President), Jodi MacQuarrie, Clayton Maitland. (See eCURA Meetings and Minutes folder for minutes.)

June 10, 2009: Presentation to Maple Ridge-Pitt Meadows School Board made by Dr. Mark Fettes, Jodi MacQuarrie and Clayton Maitland.

June 17, 2009: Interested Educators Meeting, 3:30-4:30 p.m. Rm 2011, THSS, with Jodi macQuarrie and Clayton Maitland

June 29, 2009: Partner meeting at City Hall with District/City of Maple Ridge, 2:00 p.m. Attending: Rodney Stott (Environmental Planner); Gary Manson (Communications); Gail Szostek (Environmental Planning); Brian Patel (Youth services); **SFU/eCURA team:** Sean Blenkinsop, Gillian Judson, Mark Fettes, Jodi MacQuarrie, Clayton Maitland; **Regrets:** Reps from Social Planning (Christine DiGiamberardine, Sue Wheeler) (See Partner Meeting City Hall notes in eCURA Meetings and Minutes folder)

June 29, 2009: Public Information Meeting about the project, as advertised in local newspapers, held at District Education Office, 22225 Brown Avenue, 7:00 p.m.

July 20 and August 12, 2009: Workshops for Interested Educators at Cliff Park, 11:00 a.m.; meetings with KEEPS (Kanaka Educational and Environmental Partnership) and ARMS as part of partnership-building and collaborative grant-writing.

August 9, 2009: Metro Vancouver Parks staff (Lisa Ferris) expresses interest in project and joining partnership.

August 31, September 1 and September 2, 2009: Retreat at which community partners contributed to eCURA grant application (Superintendent Jan Unwin, Councillor Cheryl Ashlie, City of Maple Ridge Environmental Planner Rod Stott, Metro Parks Lisa Ferris, Metro Parks Lori Bartley, BCIT Forestry Professor and Manager of Woodlot 0007 Jonathan Smyth, Haney Horsemen/KEEPS Dave Smith, KEEPS Ross Davies, KEEPS Rosemary Hanna, City of Maple Ridge Parks and Leisure Christine DiGiamberardine several interested educators from elementary and high school levels, Drs. Sean Blenkinsop and Mark Fettes, SD42 VP Clayton Maitland, and SD42 teacher and SFU doctoral student Jodi MacQuarrie)

September 3, 2009: Clayton meets with Donna Leon, Katzie First Nation, who agree to write letter of support and sign on as community partner for full grant application

September 4, 2009: Clayton meets with Superintendent Jan Unwin and Director of Instruction (elementary) Laurie Meston to update, discuss full grant application requirements and how support from community partners is growing, plan next steps.

September 9, 2009: Cheryl Ashlie, city councillor, sends an email to the research group stating, “A motion was passed at our council meeting last night approving in kind support of the proposed school and a letter of support to assist you with your research application.”

September 11, 2009: Meeting with SD42 district facilitators, Lisa Jakeway and Suzanne Hall, to talk about Environmental School Project’s philosophy and pedagogy (Clayton Maitland).

September 18, 2009: Meeting with SD42 Education Committee members, Eleanor Palis and Susan Carr, to up-date Environmental School Project information (Clayton Maitland).

October 23, 2009: Co-organized Metro Parks Pro-D “Get Outside”, Kanaka Regional Park, for interested local educators

October 28′ 2009: Meeting at Kwantlen First Nation with Cheryl Gabriel (Clayton Maitland)

October 28: Interested Eco-Educator Network Meeting (Harry Hooge) with Jodi MacQuarrie and Clayton Maitland

November 5, 2009: Research team meeting at SFU, environmental school funding possibilities; Email sent to people responding to survey on "Proposed Environmental School" webpage

December 8, 2009: Interested Educators Meeting (Yennadon) with Jodi MacQuarrie, Clayton Maitland, and Sean Blenkinsop

December 9, 2009: Meeting with Katzie First Nation: Chris Beeman, Sean Blenkinsop, and Clayton Maitland meet with

January 8, 2010: Meeting with SD42 School Board Chair, Ken Clarkson to up-date Environmental School Project information (Clayton Maitland)

January 11, 2010: Social Sciences and Humanities Research Council of Canada Community-University Research Alliance awards proposal: "ORS 12369 MAJOR PROJECT: Aligning Education and Sustainability in Maple Ridge, B.C.: A study of place-based ecological schooling" a five-year grant of one million dollars.

January 13, 2010: Eleanor Palis announces to Board of Trustees at that evening's Board Meeting that SFU-District 42-City of Maple Ridge eCURA grant of one million dollars over five years has been awarded, stating in her report from the Education Committee that the "Education Committee – Trustee Palis advised that she received a letter from Clayton Maitland saying some wonderful news that the Grant application was accepted and awarded for the proposed Enviro-school. This will now bring about more questions as to what the next steps are."

Clayton advises research team as to where we are with Board policy and procedures as per "Proposing Program Options." Phase of proposal is identified and areas needing to be addressed targeted.

January 14, 2010: Meeting with ARMS and Pitt Paddling Club to plan for April 23rd district Pro-D

January 15, 2010: Meeting with MRTA to update and discuss educator "certification", ongoing professional development, contract, etc. (Jodi MacQuarrie and Clayton Maitland meet with Drusilla Wilson and George Serra)

January 21, 2010: Meeting at SFU to develop Vancouver Foundation LOI (Sean Blenkinsop, Clayton Maitland, Jodi MacQuarrie)

January 28, 2010: Katzie First Nation officially added to research grant (833-2009-4005, Aligning education and sustainability in Maple Ridge, BC: a study of place-based ecological schooling) as partners.

February 1, 2010: Sean Blenkinsop meets with Superintendent Jan Unwin and Director of Instruction (elem.) Laurie Meston; Seam Blenkinsop, Jodi MacQuarrie and Clayton Maitland meet to plan a Vancouver Foundation Grant application.

February 4, 2010: Clayton and Jodi meet with Leslie Franklin, CUPE President, to discuss project.

February 5, 2010: SSHRC formally announces results of 2009 CURA formal application competition. See link at http://www.sshrc-crsh.gc.ca/site/whatsnew-quoi_neuf/pr-communiques/2010/CURA-eng.aspx

February 10, 2010: See Feb. 10, 2010 Board Minutes in eCURA Meetings and Minutes folder, pages 15 and 21 for how trustees passed motion (6-Aye and 0-Nay) to keep up-to-date with proposed Enviro-school so that lessons can be learned when following program options processes, especially if others in community want to come forward after parent choice survey and propose an alternate program/school. Question from the public about proposed school and where it would be and Superintendent Unwin responded it would depend on numbers and that initial discussions had been that it would be like program within a school, use district open space and share space with community groups.

February 15, 2010: Planning meeting with research team. Ethnographer, Dr. Chris Beeman, conducts informal interviews with Rod Stott, Clayton Maitland and Jodi MacQuarrie.

February 19, 2010: Planning meeting for Research team at SFU.

February 23rd and March 1, 2010: Meet 'n Greet for Community Partners, held at BCIT Maple Ridge Woodlot 0007, 7:00 p.m. Update, Q&A, Attendees included ARMS, KEEPS, City of Maple Ridge Parks and Rec-Neighbourhood Development Coordinator and Children's Program Planner, MRTA Pres., CUPE Pres., trustee Susan Carr (Education Committee), expected DPAC co-chair Michelle Neale but she did not show, interested community and SD42 educators, including SEAs, interested parents, Clayton Maitland, Jodi MacQuarrie, Sean Blenkinsop (Feb. 23), Chris Beeman (Mar. 1), Jonathyn Smyth (BCIT Forestry),

March 1, 2010: Interested Eco-Educators Network Meeting at BCIT Maple Ridge Woodlot 0007, 4:30 p.m., with Sean Blenkinsop, Chris Beeman, Clayton Maitland, and Jodi MacQuarrie.

March 30, 2010: Sean Blenkinsop, Clayton Maitland and Doug Hoey (Principal, SD42 Aboriginal Education) meet with Kwantlen (First Nation) Development Group in Fort Langley.

April 1, 2010: Clayton Maitland and Jodi MacQuarrie met with CEED Executive Director, Christian Cowley, to discuss the eco-school project and possible synergies in community projects, especially the MOU he's reached with SD 42 and Connex students on local farm up 232nd St., as well as community gardens. Jack Emberly, local author and performer, also attended.

Clayton and Jodi met, upon their request, with Abby Cruickshank and Carleigh Smart to discuss ARMS' possible roles, support and responsibilities in the proposed eco-school and how school would support them, also.

April 6, 2010: Clayton meets with Randy Kamp (MP Maple Ridge/Mission) to talk about the Environmental School Project.

April 8, 2010: Community-based celebration and announcement of awarding of eCURA grant. See "April 8 Grant Announce Event Attendance" document in eCURA Meetings and Minutes Folder for list of people speaking and attending. In addition, several interested parents, children and other community members attended. STAR Five catered the event, held at Maple Ridge Eagles Hall, 4:30-5:30 p.m.

April 13, 2010: Research team planning meeting at SFU.

April 23, 2010: Organized and co-sponsored, together with Pitt Meadows Paddling Club and ARMS, and jointly funded by the MRTA and eCURA grant, a professional development day called "Alouette Past and Present" to give educators and prospective parent and children an idea of what a day could look like in the proposed eco-school.

Also showcased for educators attending the kinds of outdoor activities, local resources they could partner with to broaden where, how and who educates. (Rick Hammer from PMPC and Carleigh Smart from ARMS co-facilitated a day on the water and history timeline through images, story of the horned lizard, plant identification, playing an aboriginal game called Slahal)

A**pril 27, 2010:** Partner Dialogue/Meeting at CEED. Participants discussed the proposed school, rasied concerns, voiced questions and had a robust discussion around what resources they have to offer now. The group offered ideas of possible projects and came up with a "Community Wish List" of projects and other ideas of things they'd like done and with which students could potentially be involved. **Some suggestions as to use of the Scout Building and getting in touch with local Homeschool groups need follow-up. Suggestion to also invite local Bee-Keepers group to the table as potential partners**

Parent Information Session at Yennadon School, 7:00-8:00 p.m. with 10 interested parents attending. Many similar questions about location and transportation, curriculum, but also about parental involvement, governance, decision-making, homework, report cards, and if focus on the local to detriment of what's global.

May 3, 2010: Clayton Maitland presents Environmental School Project to SD42 Aboriginal Education Advisory Council.

Clayton Maitland meets with SD42 Director of Instruction, Laurie Meston, to up-date Environmental School Project information.

Clayton Maitland and Jodi MacQuarrie attend DPAC (District Parent Advisory Council) Meeting at Samuel Robertson Technical School to do a presentation. Questions from the floor and some suggestions/follow-up information and thoughts are included.

May 4, 2010: Clayton Maitland speaks with Vancouver Foundation Program Director Mark Gifford.

May 6, 2010: Clayton Maitland meets with Cheryl Powers and other members of UBC Malcolm Knapp Research Forest.

May 8, 2010: Clayton Maitland talks to members of the Ridge Meadows Education Foundation.

May 19, 2010: Research Team participates in Canadian Network for Environmental Education (EECOM).

Clayton meets with Laurie Meston to give up-date of Environmental **School** Project.

Parent/Public Meeting/Information Session held at Yennadon Elementary School, 7:00-8:00 p.m. Hosted by Clayton Maitland and Jodi MacQuarrie

Presentation by Clayton about eco-school project and examples of how can link back to curriculum/PLOs in SS, Science, Math and Language Arts. Questions from those attending included location,

transportation, models elsewhere, curriculum, funding, support, class size, special needs, assessment and evaluation, timeline for opening, library/resources, etc.

May 27, 2010: Interested Educators Networking/"Certification" Meeting held at ARMS' Rivers Heritage Center and Allco Park, 4:00-7:00 p.m. with Sean Blenkinsop, Veronica Hutton, Clayton Maitland and Jodi MacQuarrie. Readings included 2 Barry Lopez pieces on mapping, a David Sobel chapter also on mapping and a piece on "Global Impositioning" from the online magazine, *The Walrus*. Participants engaged in small-group discussions and some mapping of their own. STAR Five catered dinner for approximately 40 people.

June 8, 2010: Clayton Maitland meets with Maple Ridge Arts Centre and Theatre, The Act, Barbara Duncan and Lindy Sisson, to talk about the Environmental School Project and possibilities.

June 12, 2010: Clayton Maitland talks to UBC Malcolm Knapp Research Forest Community Advisory Board members.

June 18, 2010: At meeting, Clayton Maitland provides up-dates to Municipal Environmental Planner Rod Stott.

June 23, 2010: Interested Parents Coffee and Dessert Chat at Yennadon School, 5:30-6:30 p.m. Hosted by Clayton maitland and Jodi MacQuarrie. Ken Knechtel, local farmer, drops in and tells us about TD Friends of the Environment and that we should apply. Parents discuss PBE, continue to ask questions around curriculum, location, transportation, educator training, and preparedness for high school.

June 24, 2020: Regular Interested Educators Networking/"Certification" Meeting held at ARMS' Rivers Heritage Center and Allco Park, 4:00-7:00 p.m. with Sean Blenkinsop, Veronica Hutton, Clayton Maitland, and Jodi MacQuarrie. Readings included a piece on mapping by Doug Aberley and another on links to curriculum within context of imaginative education by Sean Blenkinsop. Participants were led in an activity by Carleigh Smart where they worked in pairs and were blindfolded, having to "lead" their sighted partner to two locations on a map they viewed before before blindfolded. They also engaged in small-group discussions connecting the readings to the activity. STAR Five catered dinner for approximately 25 people.

July 5, 2010: Partner Dialogue at Kwantlen First Nation Office (in Fort Langley). Discussed research questions, more on sharing and exchange of resources, tools and peoples' time, knowledge and skills. Possible projects were put forth, challenges and questions discussed. Suggestions made to check out **United Way's website for tools and information** where community survey/needs assessments are concerned, as for IslandWood Outdoor School/**Wilderness Awareness School** in Seattle, too, for curriculum, model, pedagogy, how they assess and evaluate (http://www.wildernessawareness.org/index.html). Also had suggestion to consider **digital storytelling** as a means of assessing and disseminating information. Letters of support were requested once again for SSHRC and the local school district, with groups wanting examples, formal request of what is wanted, etc.

July 7, 2010: Clayton Maitland met to provide up-date and direction of planning and support with City of Maple Ridge partners Cheryl Ashlie (Councillor and member, Social Planning), Rod Stott (Environmental Planning), Sue Wheeler (Director of Community Services) and Shawn Mattheson (Social Development) at 3:00 p.m. at City Hall.

July 12, 2010: Clayton Maitland met with Directors of Instruction Laurie Meston and David Vandergugten for up-date and dialogue.

July 20, 2010: Research team meets at SFU.

August 23, 2010: Clayton Maitland meets with Laurie Meston for organizational planning and up-date.

August 24, 2010: Clayton Maitland meets with Dave Clarke at Blue Mountain Woodlot.

August 30, 2010: SFU research team spends full day organizing, discussing, and planning. Portion of day spent at Blue Mountain Woodlot.

August 31, 2010: Education Network participates in activities at Blue Mountain Woodlot with Chris Beeman, Mark Fettes, Sean Blekinsop, Clayton Maitland, Jodi MacQuarrie, and veronica Hutton.

September 13, 2010: Curriculum Planning Meeting at Maple Ridge with Gillian Judson (SFU Post Doctoral Fellow), Laura Piersol (SFU Research Assistant), Chris Beeman (Ethnographer), Jodi MacQuarrie, and Clayton Maitland.

September 14, 2010: Web Page Design Meeting with Veronica Hutton (Research Assistant), Jodi MacQuarrie, Clayton Maitland, and Cary Blackburn of Hurricane Web Design. Also, Video and Photo sessions, for movies and slide shows, with students and parents at The Act, Art Gallery, and Allco Park.

September 20,2010: Memorandum of Understanding Meeting at Municipal Hall with Shawn Matthewson, Ross Davies, and Clayton Maitland.

September 21, 2010: Clayton Maitland meets with Laurie Meston for organizational planning and up-date.

September 22 – 24, 2010: Social Sciences and Humanities Research Council, Community University Research Alliance Grant consultation and meeting in Ottawa with Sean Blenkinsop and Clayton Maitland.

September 23, 2010: Environmental School Project Educators' Network at Allco Park: "Ecological Relationships" with Chris Beeman (Professor) and Laura Piersol (SFU Doctoral Student) and Jodi MacQuarrie.

September 27 – 24, 2010: North American Association of Environmental Educators Research Symposium in Buffalo, USA, with Sean Blenkinsop, Chris Beeman, Veronica Hutton, Jodi MacQuarrie, and Clayton Maitland.

October 4, 2010: Meeting with Christian Cowley (CEED Centre) and Clayton Maitland for planning and organization of Memorandum of Understanding.

October 5, 2010: Meeting with Abby Cruickshank (ARMS Centre) and Clayton Maitland for planning and organization of Memorandum of Understanding.

October 6, 2010: North Fraser Education Forum 2010 attended by Clayton Maitland.

October 14, 2010: Sean Blenkinsop, Vicki Kelly (SFU Professor) and Clayton Maitland meet with Katzie First Nation Council.

Memorandum of Understanding meeting with Cheryl Ashlie (Maple Ridge Councillor), Mario Beaulieu (Teacher), Sean Blenkinsop, Christian Cowley, Abby Cruickshank (ARMS), Clayton Maitland.

October 15, 2010: Sean Blenkinsop, Clayton Maitland, Laurie Meston meet to talk about the Proposal for Program Options.

October 25, 2010: Environmental School Project Curriculum Design team meets at Kanaka Foreshore Park with Ross Davies

Clayton Maitland meets with Sandy Blue (Maple Ridge Economic Development) to discuss possibilities (forums, conferences, tourism, etc.).

October 27, 2010: Clayton Maitland and Laurie Meston meet to discuss proposal.

October 28, 2010: Environmental School Project research team meets at CEED Centre to discuss project and research.

Memorandum of Understanding meeting with Cheryl Ashlie, Mario Beaulieu, Christian Cowley, and Clayton Maitland.

Educators' Network session at Maple Ridge Council Chambers: "Cognitive Tools" by Gillian Judson; "Ecological Inclusivity: voice, governance, relationships, and co-educators" by Clayton Maitland

October 29, 2010: Clayton Maitland and Laurie Meston meet to talk about proposal editing.

Clayton Maitland meets with Susanne Hall (SD42 Facilitator) to talk about Professional Development Days.

Clayton Maitland Meets with Leslie Franklin (CUPE Presedent) to discuss Project and CUPE needs.

November 1, 2010: Environmental School Project curriculum design team meets with Ross Davies at BCIT Woodlot and the Kanaka Creek Conservation Park.

November 3, 2010: Laurie Meston and Clayton Maitland meet to review proposal.

November 4, 2010: Clayton Maitland and Vicki Kelly (SFU Researcher, Indigenous Education) meet with Katzie First Nation Elders, Community Liaison, and Language Specialist.

Web design team meets to review draft web pages,

November 8, 2010: Curriculum Team meet at Cliff Park and Maple Ridge Library to further design and develop curricular ideas for both educators and students.

November 10, 2010: Laurie Meston and Clayton Maitland present the Environmental School Proposal to School District 42 Education Committee, Eleanor Palis (Board of Trustees Vice-Chair) and Susan Carr (Board of Trustees). The decision is made for the Board to have a presentation and view the proposal on November 24, 2010.

Appendix 2
SOCIAL SCIENCES AND HUMANITIES RESEARCH COUNCIL
ENVIRONMENTAL – COMMUNITY UNIVERSITY RESEARCH ALLIANCE
LETTER OF INTENT

Aligning Education and Sustainability in Maple Ridge, BC Blenkinsop, Sean

1. Summary

Aligning Education and Sustainability in Maple Ridge, BC: A Study of Place-Based Ecological Schooling

Public education systems, across the industrialized world, tend to be isolated from local processes of knowledge-building, planning, and decision-making for sustainability. In addition, although efforts have been made over the last three decades to include environmental education in school programs, their overall impact has been limited. Environmental education programs are rarely integrated with the mainstream curriculum, are typically of short duration, often lack theoretical or methodological sophistication, and show little compelling evidence of having long-term effects on most students‟ thinking about or engagement with diverse others including the natural world.

This research project seeks to build and study an alternative model of environmental education in the community of Maple Ridge, BC. This rapidly growing picturesque municipality (pop. 60,000) on the north shore of the Fraser River, just east of Vancouver, BC, is widely regarded as a leader in sustainability initiatives in the province. In 2007, the District Council reshaped its long-term Strategic Plan "to address not only environmental sustainability, but also social and economic sustainability." Taking this local vision as a starting point, the local school district (School District 42) and researchers in the Faculty of Education at Simon Fraser University (SFU) will work together with the municipality to develop an environmental school and learning centre, in which learning across the curriculum is tied to the growth of environmental awareness, engagement with the natural world, and community sustainability.

The project builds on existing partnerships within Maple Ridge, where a strongly collaborative problem-solving culture has developed over the past fifteen years, and on a body of expertise in environmental and community-based education at SFU. The project's cross-curricular, integrative focus is informed by the theory of learning and curriculum developed by SFU's Imaginative Education Research Group, which offers teachers a comprehensive framework for engaging their students‟ thoughts and emotions in learning, and for thoughtfully guiding the development of their understanding to become energetic, useful, flexible, and lasting. Recent work has demonstrated the value of this theory for culturally inclusive and community-based approaches to education, and highlighted its potential as a theoretical and methodological framework for environmental education. The project will allow this body of scholarship to be tested, refined, and extended.

This research is expected to have direct benefits for the community of Maple Ridge, by building a substantial knowledge base in education for sustainability that will influence teaching, learning, and school administration throughout the district. It will also yield a detailed picture of an alternative model of environmental education that could be of immediate practical value for municipalities and districts across Canada (and other countries). Finally, it will make a unique contribution to the scholarship on place-based ecological education, introducing new theoretical ideas in a context of community-based practice. Care will be taken, throughout the project, to communicate the research approach and findings to a wide range of stakeholders, from those in the local community to organizations, policymakers, and researchers at the provincial and national levels. By involving all these stakeholders across governmental levels in knowledge mobilization activities throughout the project, we believe there is a strong likelihood that this research will have a significant public policy impact across Canada.

2. Detailed Description

2.1. Education and sustainability: A research priority for British Columbia and Canada

"Lead the world in sustainable environmental management" stands as the fourth of the current B.C. government's five Great Goals. "Make B.C. the best-educated, most literate jurisdiction on the continent" ranks as the first (Government of BC, 2006). On the face of it, these two major policy goals – representative of similar objectives being pursued by state, provincial and national governments throughout the industrialized world – have little to do with one another. Education and the environment involve different policy mechanisms, different branches of government, and different constituencies – an impression confirmed by examining the Service Plans of the Ministry of Environment (2008) and the Ministry of Education (2008). Yet at the level of communities, municipalities, and districts – the context in which people live, work, go to school, and actually interact with the environment – this policy divide becomes a significant obstacle. Many aspects of the sustainability plans adopted by BC municipalities (e.g. District of Maple Ridge, 2007) require changes in people‟s behaviour, and such changes almost inevitably imply changes in knowledge, beliefs, and values – a clearly educational mandate. Yet many of the practices of schools (and other learning institutions) reduce learners‟ contact with the natural world, focus their awareness away from the local and particular, and place them in an essentially passive relationship with knowledge (Louv, 2005, Smith & Williams, 1999). If, as David Orr claims, "all education is environmental education" (Orr, 1992, 90), then schools in their present form may actually be subverting governments‟ sustainability agendas – not by intention, but by virtue of the unexamined assumptions they have inherited from the industrial age (Bowers, 1997; 1995).

Of course, many sustainability-related educational programs and initiatives exist, not only in B.C. but across Canada and North America. Outdoor (Gair, 1997), experiential (Warren et al, 1995), environmental (Van Matre, 1999) and place-based (Sobel, 2005; Gruenewald & Smith, 2008) education are all part of the spectrum of ideas and practices that have sought to develop a knowledge and love of the natural world, and an ability to examine and change one‟s own behavour to live in greater harmony with other living things and living systems. After some thirty years of such efforts, however, it is not clear what they have accomplished. Typically of short duration, they often lack theoretical or methodological sophistication, are marginal to the mainstream curriculum, and show little evidence of long-term effects on most students‟ thinking about or engagement with diverse others including the natural world (Rickinson, 2003; Bocarro & Richards, 1998).

The research question that presents itself, then, is whether education and sustainability can be brought into closer alignment with one another, not just at the level of policy, but in terms of the relationship between particular schools and the communities and natural systems in which they are situated. Such research will necessarily be long-term and collaborative, and address not only issues of curriculum and pedagogy, but also school administration, school-community relationships, teacher development and the building of a community of practice, and – perhaps most centrally – complex shifts in learning outcomes. A child‟s understanding of history, geography, science, math, and language may look quite different, on the basis of a range of assessment methods and criteria, if it is tightly interwoven with knowledge of local communities and natural systems. Research into such shifts is essential if this kind of ecological, place-based education is ever to become the focus of system-wide change.

The research project proposed here involves researchers at Simon Fraser University and a variety of community partners in Maple Ridge, B.C. Research will focus on the first five years of operation of a magnet school for place-based ecological education within the public school district of Maple Ridge/Pitt Meadows. As described below, our purpose is both to develop a detailed, viable model for establishing such schools in other communities, and to explore the outcomes of this educational approach. Knowledge developed within the project will not only be of direct benefit to the

community of Maple Ridge, and of potential benefit to many other towns and cities across Canada, but will make important contributions to several areas of educational research.

2.2. Importance of the project to community development: In 2007, the District Council of Maple Ridge reshaped its long-term Strategic Plan "to address not only environmental sustainability, but also social and economic sustainability" (District of Maple Ridge, 2007). Recognizing that "the legacy of planning choices can last for hundreds of years," the District has begun to sketch a vision of the community in 2025, when children now being born will be graduating from high school. What kinds of knowledge, skills, and values will those graduates of 2025 need? Despite its importance, that question has barely begun to be addressed at the local level. For example, among the six "core values" of School District 42 (2008), neither the environment nor sustainability receive a mention. All six values relate in some way to inclusion (success for all learners), but inclusion is limited to what might be termed the cultural or human environment, with no mention of the non-human world. Similarly, the time frame in the mission statement is immediate: all verbs are in the present tense, and no references are made to either past or future. Thus the policy divide at the provincial level translates to a cultural divide at the community level. Because the roots of this divide go very deep, involving tacit values, patterns of awareness and assumptions that are reinforced by the daily structures and routines of life in schools, they cannot be meaningfully addressed in a piecemeal fashion. Rather, one needs a stable cultural institution – a single school being the smallest such unit – that is committed to rethinking and reworking everything that it does from a sustainability perspective, and doing so in communication and collaboration with community organizations and local experts across the full range of relevant issues. The intensive case study proposed here will yield invaluable guidance for larger-scale efforts.

2.3. Importance of the project to academic knowledge: Research on environmental education and its relatives (place-based education, outdoor and experiential education, eco-pedagogy, etc) extends back only thirty years or so (Warren et al, 1995; Gruenewald & Smith, 2008; Kahn, 2008). The field suffers from two major weaknesses. As alluded to above, environmental education has a marginal place in most formal education systems, so that a great many studies describe "tinkering" varieties of educational response to deep systemic problems. Even when such a "green veneer" is thoughtfully done, it may have little long-term impact or deeper significance (Jardine, 1998; Hart, 2003). And this lack of generalizability points to the second weakness: the absence of a sufficiently powerful *educational* theory to allow studies conducted in vastly different settings, and employing very different kinds of activities and discourse, to be productively compared, critiqued, and built upon (Boccaro & Richards, 1998).

It will be apparent, from the above description of the project, that it is designed to address the first of these shortcomings. Rather than attempting to address sustainability in the context of a particular program, in particular curriculum materials and units, and so on, this research seeks to understand sustainability education as an enacted cultural achievement in the context of a given school, community and place. This ethnographic approach is absent from the environmental education literature, as is research that explicitly sets out to connect the school with local planning for sustainability.

The second shortcoming in the research literature will be addressed by explicitly aligning the project with the internationally acclaimed work of Kieran Egan, Tier 1 Canada Research Chair at SFU. Egan‟s exploration of the role of the imagination in teaching and learning (Egan 1986, 1988, 1990, 1992, 1997, 2005). has inspired numerous innovations in theory and practice across many settings (e.g. Egan, Stout, & Takaya, 2006; Judson, 2008). Particularly relevant for this project is work connecting Egan‟s theoretical explorations to perennial issues in environmental education (Blenkinsop, 2008), and research emerging from a previous Community-University Research Alliance project in culturally inclusive education (Fettes, 2005; 2006; Chodakowski et al, 2007). In the latter project, a collaboration with school districts and First Nations communities in three areas of

B.C., Fettes found that the teachers in the project tended increasingly to look for place-based ways of teaching the academic curriculum, as their understanding of Egan‟s theory grew, along with their ability to apply it in the diverse classrooms and communities in which they taught (Blenkinsop and Fettes, 2007; Fettes, 2008; in preparation). The methods and findings of that prior project have proven invaluable in shaping this proposal. Aligning Education and Sustainability in Maple Ridge, BC Blenkinsop, Sean.

2.4. Academic and community partners

2.4.1 Faculty of Education, Simon Fraser University: Since its establishment in the 1960s the Faculty has been noted for its innovative practice-centered approach to teacher education, its ongoing research and programming in environmental education, and its tradition of engaged scholarship. Its community-based professional programs have made important contributions to building local capacity and expertise in districts throughout BC. This range of expertise is reflected in the research team:

Sean Blenkinsop (Assistant Professor; lead applicant)	Over 25 years experience in outdoor, environmental, and experiential education as a teacher, curriculum designer, program manager, and researcher. Will lead research team.
Mark Fettes (Assistant Professor; co-applicant)	Research on Aboriginal and community-based education; principal investigator for prior CURA project. Will provide organizational expertise and lead research on school organization and leadership.
Kieran Egan (Professor; co-applicant)	Tier 1 Canada Research Chair in Education; philosophical exploration of imagination in learning and teaching. Will contribute to elaboration of theory and practice and lead project‟s publication program.
David Zandvliet (Associate Professor; collaborator)	Coordinator of environmental education programs at SFU; research on environmental curriculum, schooling, pedagogy. Will contribute to all aspects of project, especially curriculum research.
Vicki Kelly (Assistant Professor; collaborator)	Research and practice in indigenous education and pedagogies, outdoor and holistic education, and the arts. Will contribute to all aspects of project, especially teacher development and pedagogy.
Janet Moore (Assistant Professor, collaborator)	Member of B.C. Working Group on Sustainability Education, research on sustainability policies and programs in educational institutions and community organizations. Will contribute to policy aspects of project.

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Appendix 3
List of Communication and Forum Activities

- Regular Team meetings and information conversations with School District #42
- Web Page (http://www.sd42.ca/environmental-school) and the development of new web page for increases to social networking possibilities
- Brochure (http://www.sd42.ca/system/files/enviro%20school%20brochure.pdf)
- Community University Research Alliance – environmental call (e-CURA) Grant Public Announcement
- Partner/Collaborator Dialogues
- Educators' Network
- SFU Faculty of Education Dialogues
- Parent and Public information sessions
- Conference participation
- Media Interviews: NEWS, TIMES, SFU Media, McClean's Magazine, Suite101 On-line Magazine, CBC Radio
- Email - News Letter
- ListServes: Partners and Collaborators; Educators; and Parents
- Social Sciences and Humanities Research Council (SSHRC): e-CURA meeting and networking, Ottawa
- North American Association of Environmental Educators (NAAEE), Buffalo

Appendix 4

Indication of community support

- Parent meeting attendance
  - 96 contacts on listserv
  - ~ 25 parents regularly at meetings
- 17 community partners and collaborators
- Community/Partner dialogues
  - 15 partners participate regularly at dialogues
  - Oral support and interest
- Letters of support
  - Two consecutive SD#42 Superintendents
  - Chief Mike Leon, Katzie First nation
  - District of Maple Ridge
  - Kanaka Education and Environmental Partnership Society
  - Metro Vancouver Parks
  - UBC Malcolm Knapp Research Forest
  - The ACT, Art Centre and Theatre
- Educators' network
  - 102 contacts on listserv
  - 30 participants regularly at network sessions
- Memo of Understanding (in process)
- Environmental School Project's Survey –
  - 102 participants
  - 85 respond with "Yes."
  - 14 are not enrolled with the district
  - Interest from Abbotsford, Coquitlam, Langley, Mission, Vancouver
  - Interest from people moving into Metro Vancouver.
- School District Survey – approximately 400 parents interested in Environmental School

Appendix 5
Environmental School Project
Place-based, Imaginative and Ecological Schooling

Place-Based, Imaginative and Ecological Schooling involves five strands of pedagogy woven together: Place-based Education, Imaginative Education, Inquiry Method, Inclusion, and Environmental Education.

Place-based Education:

- People reconnect the natural and human world.
- Learners become part of and participants in their community by exploring and connecting to their culture, neighborhoods, parks, local histories and knowledges.
- Learners are empowered through a deeper understanding and skills, and participation in civic life and with the natural world.
- Learning in place is experiential and in context.
- Learners will work on projects, local issues, and problem solving in context of their lived experiences.

Imaginative Education:

- Students engage imaginations in learning.
- Teachers engage imaginations in teaching to make knowledge in the curriculum vivid and meaningful.
- This involves frameworks to develop specific cognitive tools and pushes learning towards a deeper understanding of the fears, hopes, and passions of real people.
- Learners will be engaged emotionally and imaginatively with the cultural and historical meaning of knowledges in order to create new knowledge.

Inquiry Methods and Project Learning:

- Student-centered method of learning focused on asking deep questions.
- Students are encouraged to ask questions which are meaningful to them, their community, and other communities.
- Projects are initiated because questions, problems, and issues do not necessarily have immediate answers.
- Teachers are encouraged to guide and facilitate questions, projects, and learning opportunities.
- Project-based learning is a dynamic approach where students explore deeper into specific topics and real-world problems, issues and challenges.
- Inquiry method and project-based learning creates students who are active and engaged, and inspired to obtain a deeper knowledge.
- Learning occurs experientially, in context and hands-on.

Inclusion:

- Inclusive learning will emphasize learner strengths and talents, and will work on challenges.
- Learners will have their voices heard by including them in curriculum, criteria and governance.
- People will embrace the notion of community as learners and educators.
- All will have voice: students, parents, educators, and community collaborators.
- Inclusion also moves beyond the human element to welcoming the natural world as a co-creator and teacher. The environment participates and is re-connected to learners.
- This form of inclusion will enable deeper understandings of cognitive tools, experience, and skills for all learners.

Environmental Education:

- Focuses on reconnecting natural and human ecosystems so that human beings appreciate nature and understand ecosystems in order to live sustainably.
- Includes outdoor education and experiential education.
- Ecoliteracy helps to define greater understandings of the natural world and the natural systems that make life on earth possible.
- The learning process includes all environments as a teacher and co-creator of experience and knowledge. People will understand how different environments affect learning.
- Knowledge and awareness about different environments and the natural world develops the attitudes, skills and expertise for critical thinking, informed decision making, problem solving, and responsible action.

Appendix 6

Theme Stories for Three Locations

Rivers and Time

Maple Ridge/Pitt Meadows is a place shaped, both geographically and culturally, by water. About 12,000-15,000 years ago, Pitt Lake was a saltwater fiord of the Pacific Ocean. As the glaciers of the last ice age melted and receded the geographical features of this place were shaped. In addition to being one of the area's most outstanding natural features, water played and continues to play an integral part in the culture of the Katzie people, the first peoples to inhabit the area. Water influenced where and how they lived, what and how they hunted, and how they imagined the world around them. To those arriving to the area much later, hoping to settle and cultivate the land in and around Maple Ridge, the abundance of water was both a useful resource and a constant challenge. The rivers offered easy access to water for agriculture, fishing, and, in the 20th century, energy production. The recreational opportunities afforded by waters flowing through Golden Ears National Park draw people to this place from around the world. At the same time the flooding waters of the Fraser River demonstrate the virtually unstoppable forces of nature. The story of water is one of relationship between more-than-human and human worlds from the time of the forming of the terrain, through the early years of the Katzie first nations people, to the arrival of traders, a few early settlers and, ultimately many land speculators. It is this story of water through place and time—its geographical, ecological, and cultural role in the shaping of Maple Ridge/Pitt Meadows—that can serve as a basis for a year-long, place-based and imaginative curriculum.

Students will learn about this story in three places connected in space and time by the rivers of Maple Ridge/Pitt Meadows. Each location offers unique learning possibilities for studying the interconnectedness of the place *from* the place, while simultaneously addressing the prescribed learning outcomes as outlined by the Ministry of Education. (See the example unit/lesson plans for Site Two: Kanaka Park). Let's take an imaginative glimpse into what and how each of these places can teach.

Site One: Allco Park. Students are engaging with the flora and fauna of the place from various perspectives that include inhabitants such as raptor birds, huckleberries, liverworts and, at one time, wapato. They imagine the place also as would a young Katzie hunter, a fur trader, a land surveyor, or perhaps a businessman—enter David Oppenheimer, Edward Mohun or Arthur W. Vowell, owners of the British Columbia Drainage and Dyking Company, or George Abernathy or L.S. Lougheed original owners of the Abernathy and Lougheed (A & L) logging company. They document their ongoing experiences in a creative journal that contains their observations of the natural world around them, daily entries that contain both written text and visual images. They relive the fire that burned for months in the area in 1931, a fire that ended A & L logging in the area and created conditions for the emergence of a new ecosystem. They participate, too, in the more recent story of the death and rebirth of a river and its inhabitants. The story takes students deeper into the story of the water, into the Alouette and Kanaka Rivers, and a community's struggle to take back and restore a natural resource.

Site Two: Southwest of Allco Park, connected by the land forms between Alouette River and Kanaka Creek, is Kanaka Park. At the Bell-Irving Hatchery in Kanaka Park, students "think salmon" as our story hones in on the heart of the ecosystem: fish. Historically, the rivers were abundant in fish, much more abundant than they are today. Some of the fish in these rivers were absolutely huge. It was not uncommon, for example, for sturgeon to grow to twenty feet in length and more than a thousand pounds in weight (Macdougall, ????, p. 9). Students are encouraged to imagine what it would be like to catch a great sturgeon. No modern fishing gear allowed. A young Katzie hunter has a harpoon and, potentially, one chance at making THE biggest catch of his life. He paddles softly, silently in the smooth waters of the Kanaka River. He watches the rippling water, adept at reading the water to determine the location of his target. He is directly overhead. Glancing carefully into the water, his feet placed firmly in the canoe, he sees a sturgeon about 10 feet in length and weighing, he thinks, about 300 lbs. He must strike on the sturgeon's back, just below the head. And then a different story, when Kanaka creek

Site Three: Our story leads us back in time. It is the turn of the twentieth century. We move north to **Pitt Lake**. Imagine you have heard the legends told about a lost mine full of gold. You yearn to find the riches hidden the hills. You have also heard legends told of misfortunes befalling those who seek the gold. You are hiking in the forested hills rising up above the east side of Pitt Lake, hills that are over 100 meters above sea level. As you go you encounter a diversity of animal and plant life including, to your surprise, something you never expected: seashells. How is this possible? The answer lies in the geographical history of the place, a place that is still, in geological terms, emerging. As students unravel this mystery they will engage with the flora and fauna of the area, learning about its ecology and its history first hand.

Appendix 7
Story for a Day
Cliff Falls: Sample Day

Narrative	Cognitive Tools - IE	Skills	Learning Outcomes	Big Ideas
Themes: • Cliff Falls story • Measurement • Collaboration • Growth ***Set-Up:*** Learners arrive at Cliff Falls park and move the day's materials to the picnic area. Attendance taken and sent in via wireless laptop or phone. Base camp (picnic area) set up and organized. Guidelines for expected behavior in a natural environment reviewed with students and guests. Any guest teachers (formal and informal) are introduced to the learners. It is a wet day, so activities are chosen partially based on their weather connections. ***Location and Temporary Boundaries:*** The people involved walk around the area, getting to know the learning environment. As they walk they engage in conversations about safe boundaries and sights, sounds and scents. The cultural and geological history of the area is shared with learners as they walk. ***Day plan:*** <u>Morning Activity: Math</u>	Cultural & Social relationships; responsibility to others Somatic understanding; bodily senses, emotional responses & attachments Mythic understanding; story Romantic understanding; sense of wonder Somatic understanding; bodily senses, intentionality, referencing Mythic understanding;	Community; Social responsibility; Communication; Collaboration; Leadership; Listening Observing; Listening: Sensing Observing; measuring; calculating; estimating; spatial	Community Vocabulary Space & Shape: measuring Number referencing;	Surroundings

Learners are broken up into primary and intermediate grade groups for the morning math activity. *Primary activity:* The primary students find puddles and engage in a measuring activity. Using a ruler learners record depth measurements in horizontal and vertical grids of a puddle. KG students find a stick and see how many sticks long, wide and deep the puddle is. All students are given the chance to ask questions about puddles and what creatures they might find there. Back at the picnic area the grades 1-3 learners use these measurements to create a contour map on paper and then create one out of cardboard. KG students are read a story about puddles and rainy days and do an activity about the letter P for puddle. They could find manipulatives in nature such as sticks or rocks to make the shape of the letter P, and then practice writing it on their portable dry erase boards or writing journals. *Intermediate Activity:* Measuring Tree Height: Learners make a gauge, plumb bob or clinometer to use as measurement tools. Learners find a tree to measure. First they identify what type of tree it is using ID books and/or onsite expert.	sense of wonder Mythic understanding: story Romantic understanding: extremes & limits of reality, sense of wonder	relationships Observing; measuring; calculating; estimating; spatial relationships Communicating Observing; measuring; calculating; estimating; spatial relationships	Space & Shape: measuring	Characteristics of living things

Learners then use the tools they have made to measure the height of their chosen tree. Students record their results, showing their calculations, and share with peers and teacher. Fitness and nutrition breaks as needed. <u>Afternoon Activity: Tree math</u> All students begin this activity together near the picnic area. Group discussion; "how to do you know how old someone or something is?" Teachers share a story about the oldest trees in the world (oldest tree known to us is a spruce tree in Sweden at 9550 years old!). Show pictures of this tree, and trees from the Carmanah Walbran provincial park in BC (Three Sisters, Heaven Tree and the oldest trees). In multi-age small groups learners ID their trees, and measure the girth of the trees in the picnic area using pieces of string. Intermediate students do a more precise calculation based on the typical deciduous tree growth in girth of about 2.5 cm per year. Whole group gets together and compares results. A large chart is created that records the whole group's results (large chart paper?). Discussion of results. Learners get back into groups and find a tree whose branches grow in whorls. They count the whorls to estimate the age of the tree (ID the tree). Share results with whole	Somatic understanding: bodily senses, gesture and communication Mythic understanding: story, forming images		Space & Shape: measuring Patterns & Relations Writing & representing	

group by acting out the age of their tree (see "Find your age" and "tree silhouettes" from Sharing nature with children) and creating a story about the life of their tree. In their nature journals learners reflect on what they have learned today. KG and grade 1 students draw what they have learned about and Grades 2-7 draw and write about what they have learned. ***Debrief of the Day***: Summary, stories, needs Preparation for next day Book exchange (mini portable library) Clean up Reading examples provided for parents and collaborators. **Resources:** • Local experts on trees at Cliff park • Books about trees found at Cliff park • "An early start to nature" by Roy Richards for activity instructions • Internet websites for oldest trees and Carmanah Walbran park				

Allco Park: The Story

The Day: Narative K – 7 Activities	Cognitive Tools	Skills / Learning Outcomes
Allco Park: The Story Themes: - Building relationships - Reconnecting to the natural world - Mapping: layers, the place, learning, community - Water: interconnectedness of all things - The Alouette River Story		
Set-up: Learners arrive at Allco Park and move the day's study and lab materials to the shelter. As a team and community, a "base-camp" is set up at the shelter. Materials are gathered and organized.	Cultural and social Relationships; Responsibility to others	Community; Social Responsibility; Communication; Collaboration; Leadership; Cultural Characteristics
Location and Temporary Boundaries: The people involve walk around the area, getting to know the learning environment. As they walk they engage in conversations about safe boundaries and sights, sounds and scents. Along a trail a student notices a lizard. Another student explains that the animal is a salamander. Dialogue begins about salamanders and their home. Time is spent examining the area and the salamander`s habitat. Some students become very interested and begin to formulate stories. The students are organized into small groups with deeper questions about the salamander`s story, including the natural world and human world influences on the life of the salamander. Students begin to pace of steps to the perceived boundaries of the salamander's home. Comparisons are made to the salamander boundaries and the group's boundaries. The group continues to discover the place where they will be learning over a period of time. The walk continues around the safety boundaries where a student discovers some salmon skeleton. Questions began as to how the skeleton got this far from the river. Dialogue formed around the questions. Stories and possibilities were shared. The talking continues as everyone returns to the base-camp.	Sense and orientation of place and space; Somatic engagement; Use of Story; Oral language development Inquiry; Developing voice; Spatial Relations; Seasons; Time; Spatial relations; Oral language;	 Observing; Listening; Sensing; Vocabulary; Mapping; Vocabulary; Community; Habitat; Ecosystems; Human interactions Asking questions; Measuring; Estimating; Calculating; Number referencing; One-to-one correspondence; Comparing; Vocabulary Analyzing; Measuring; Estimating; Number referencing; One-to-one correspondence; Vocabulary; Life cycle
The day plan: Discussed - shape of the day and time ahead Attendance etc.		Sequencing; Organizing; Planning;

"Tell, talk and show" about the Alouette River Story (Introduction, stories, and overview to understanding, knowledge and history of the area) o geology, natural world, ancient peoples, and human influences Mapping Activity o Walk to "quiet spot" to discover something of a focus: shape, color, texture, sound o Talk about "place" and mapping: specific to focus ▪ Levels of mapping; types of mapping o Label focus in "quiet spot" o Draw map of focus o Talk and demonstration of point to point referencing on a map; grids o Demonstration of visual point referencing (with string) ▪ Students build "practice" referencing string pattern ▪ Build a "referencing pattern" for their focus spot o Talk of focus spots ▪ Present focus spot Fitness breaks as needed Telling Story and Reading story o Strategies, dialogue, related to mapping Create own story related to focus o Draw, Create, Tell, Write Debrief of the Day o Summary, stories, needs o Preparation for the next day o Clean up Reading examples provided for parents and collaborators Resources: Alouette River Management Society (ARMS) Centre Allco Park Shelters, Wood heaters, Outhouses, Electricity (if needed) Elders		
	Story; Oral Language; Imagination;	Observing; Listening; Imagining; Geology; Soil; Rocks; Habitats; Ecosystems; Characteristics of Ancient civilization;
	Relationships; Somatic understanding	Sensing; Color, shape, texture, sound; mapping
	Perceptions; Communication;	Mapping and map designing; Describing;
	Transference;	Interpreting; Labeling; Letter and word recognition; Vocabulary;
		Representing;
		Designing; Interpreting; Point to point references; Patterns; Numbers; Graphing; Algebra and Operations;
		Presenting; Speaking; Listening;
	Kinesthetic sense;	Healthy living; Daily physical activity;
	Imagination; Oral Language; Metaphor;	Imagining; Visualizing; Reading;;
	Oral language to symbols and written language;	Creating; Speaking; Writing; drawing;
	Oral language; Story; Voice; Community; Resonsibility;	Social responsibility; Listening; Telling; Planning; Organizing; Community; Governance;

BC Hydro Activity Possibilities: Get Outdoors Project Wild Sharing Nature With Children		

Appendix 8

Extended Activities

Up Kanaka Creek

Topic/Overview

The following narrative will frame teaching Science for Grades K-7 at Kanaka Park. Through their learning at Kanaka Creek Park and at the Bell-Irving Hatchery students will be introduced to the diversity of plant and animal life in their local watershed. Over 12 weeks, the students will have in depth studies at three sites along Kanaka Creek as they follow the salmon in their migration from the ocean to their breeding grounds. Along the way, students will investigate the interconnection between the landscape and the creek through a diversity of activities that engage them with the place, allow them to learn from the place and fulfill mandated curricula for Science, Social Studies, Language Arts, and Physical Education. Activities they will engage in as they explore the creek will aim to deepen their understanding of the important role that salmon play in both aquatic and terrestrial food webs. Through the process of learning they will be encouraged to really get to know salmon: they will tour the local hatchery to get a unique chance to view the life cycle of the salmon up close and they will spend time in the park, creekside, engaging in detailed observations of the salmon. In this unit, students will not only learn about the role that humans can play in protecting salmon within the watershed but actually take part in it themselves as they mark storm drains in a local neighbourhood.

Cliff Falls at Kanaka Creek

Interdisciplinary Unit Plan K-7

One week introduction

Theme: Change/Cycles

Narrative:

Late fall, rays of sunlight climb upon the leaves of the big leaf maple and spread in golden waves along the path as we walk through the forest to Cliff Falls. We come across some old cedar stumps and find an old logging notch in one stump that is 5 feet high. This cut in the wood speaks of us a time when logging was a manual job. We imagine the sound of creaking boards and the slow grunt of the saw as the loggers teetered high above the forest floor, slowly working their way through the giant girth of the tree. Now the remnants of these trees are nurse stumps for new life; we find one covered in long spidery roots as it supports a large hemlock. Another smaller stump nearby is covered in moss and a huckleberry bush. Next to the moss we find some tree rings, and studying their pattern we learn what years were dry, where the tree lost a branch, years of fire and insect infestation and where other trees

grew up around it. The tree tells us how this very spot has changed over the years. Such clues of change are around us, it`s just a matter of taking the time to stop, look, and listen.

Through the forest we hear a sharp cry and look up to see a bird fly by. Four dark bands and white rounded tip of the tail tell us it was a cooper's hawk. We watch as it flies from perch to perch and intently watches some chickadees flittering in out of the salmonberry bushes nearby. The days are getting colder; this morning we can see our breath form misty trails on the air as we lift the binoculars up to our eyes. The hawk will be getting to migrate soon, changing seasons, changing place.

Change is even embedded in the sculptured bed that the creek flows over. This rolling rock speak to us of an ancient sea where deep slow moving waters allowed fine sand and clay particles to settle out in layers. These layers of sand trapped over the years transformed into caramel coloured sandstone and clay layers transformed into the dark shale that we see today. Each layer of rock is a page from the earth long ago.

Further down the creek, the force of the water hitting rock has scoured holes several feet deep in the sandstone: rounded portholes to the underwater world. We peek in to see the amber coloured water flowing below. Looking close at the nearby shale we trace our fingers along the branched patterns of plants captured in the mud here some 40 million years ago. Some of the plants found fossilized here can no longer grow here due to the change in climate over the years such as the swamp cypress and the dawn redwood. We study these snapshots, tracks of a time and place which we can only imagine. Humbled by these changes that are far beyond the scope of our lifetime we move quietly along the trail.

We find an overlook next to the falls; someone wonders how many others have sat in this spot and marvelled at the world around them. As we sit in the forest, lush green swordferns towering above our heads, our faces cool in the mist, our minds stop racing, our bodies slow down and we begin to understand why Cliff Falls has long been a sacred site for the Sto:lo people. The land and creek are dynamic but the deep connection to this place felt by people remains constant.

Learning With and About Cliff Falls: Experiential, Inquiry, Project-Based Learning in Practice

While we have suggested Prescribed Learning Outcomes (PLOs) and activities Cliff Falls, there will be overlap between the grades and other sections of the park as the students are learning. Our goal is to have each activity address multiple subjects and PLOs where possible, and to have multi-age groups of students working together. However, student assignments and assessment will be tailored to be age and ability appropriate. Instruction will also be differentiated to allow for multiple intelligences, student abilities and individual interests.

Learning Outcomes Covered:

Grade	Subject	PLOs	Activity #
K	LA	Printing most letters and simple words Develop familiarity with the alphabet	3
1-3	LA	Create imaginative writing and representations Use speaking and listening to interact with others Create straightforward informational writing and representations, using prompts to elicit ideas and knowledge Use writing and representing to express their personal responses and likes or dislikes about experiences or texts Use some features and conventions of language to express meaning in their writing and representing	1 2 5 6 8 8
1-3	LA	Read and demonstrate comprehension of grade appropriate literary and informational texts	2 5 8 10
4-7	LA	Listen purposefully to understand ideas and information Select and use strategies when expressing and presenting ideas, information, and feelings Demonstrate enhanced vocabulary knowledge and usage Reflect on and assess their speaking and listening Read fluently and demonstrate comprehension of a range of grade-appropriate literary and informational texts	1 2 5 6 7 8 10

K	Math	Number sequence to ten Direct comparison for length, mass and volume Repeating patterns of two or three elements Single attribute of 3-D objects	2 4 11 4
1	Math	Arrangements up to 10 objects Numbers in depth to 20	4 11
K-2	Math	Attributes of 3-D and 2-D objects	4
2	Math	Data about self and others Concrete graphs and pictographs Even, odd, and ordinal numbers Addition and subtraction to 100	2 11 4 4
3	Math	First hand data Bar graphs Perimeter of regular and irregular shapes Faces, edges, and vertices of 3-D objects	2 4 11 4
4	Math	Many-to-one correspondence including bar graphs and pictographs Rectangular and triangular prisms Area of regular and irregular 2-D shapes Addition and subtraction, multiplication, fractions Decimals to hundredths	2 4 11 4 4 4
5	Math	Perimeter & area of rectangles Length, volume and capacity Parallel, intersecting, perpendicular, vertical & horizontal edges & faces	4 11 4

		Mental mathematics for multiplication Decimal and fraction comparison	4
6	Math	Perimeter and area of rectangles Types of triangles Regular and irregular polygons Factors and multiples Multiplication and division of decimals	4 11 4
7	Math	Table of values and graphs of linear relationships Properties of circles Area of triangles, parallelograms and circles Division, percents, fractions	2 4 11 4
K-7	Visual Arts	Creating images for a variety of purposes Using image sources such as imagination, observation and stories	1 2
K	Science	Use the senses to make observations	1 10
K	Science	Describe features of local plants and animals	1 10
K	Science	Demonstrate the ability to observe their surroundings	1 10
1	Science	Classify objects, events, organisms Describe properties of materials including color, shape, size, weight Describe features of local plants and animals Describe features of their immediate environment	1 2 4 10 8

2	Science	Use their senses to interpret observations Describe some changes that affect animals Describe way in which animals are important to other living things and the environment	1 2 6 10
3	Science	Measure objects and events Compare familiar plants according to similarities and differences Describe shapes that are a part of natural and human-built structures Describe characteristics and movements of objects in our solar system	2 4 11 4 4
4	Science	Use data from investigations to recognize patterns and relationships to reach conclusions Compare the structures and behaviors of local animals and plants in different habitats and communities Analyze simple food chains Demonstrate awareness of the Aboriginal concept of respect for the environment Measure weather in terms of temperature, precipitation, cloud cover, wind speed and direction	1 2 10 2 5 4
5	Science	Analyze how the Aboriginal concept of interconnectedness of the environment is reflected in responsibility for and caretaking of resources Identify the steps in designing an experiment Analyse how BC's living and non-living resources are used	2 7 4 7

6	Science	Distinguish between life forms and know the five kingdoms Analyse how different organisms adapt to their environment Manipulate and control a number of variables in an experiment	2 6 7 10 4
7	Science	Analyse the roles of organisms as part of interconnected food webs, populations, communities, and ecosystems Assess survival needs and interactions between organisms and the environment Evaluate human impacts on local ecosystems Test a hypothesis by planning and conducting an experiment that controls for two or more variables	2 7 10 7 9 4 7

Activities and the Cognitive Skills, Values, Assessment Opportunities, Multi-age Considerations, and Resources which Accompany Them:

Note: Not all of these activities would occur within a one week period. There are several activities outlined as possibilities which can be spread out over a longer period of time. Additionally, many of the activities found in "Up Kanaka Creek" can be used at Cliff Falls and/or in conjunction with park-wide projects.

Day One

Activity #1

Sensory Wake Up

(from "Get Outdoors")

This Activity has two stages. Students start by closing their eyes and becoming aware of what they feel, smell, and hear around them. Then they are given colour scheme cards and sent to find matching

colours in nature (Rainbow Chips activity from "Get Outdoors"). After finding their colours students complete a follow-up activity that is age appropriate.

K	Show their colour matches to the teacher and describe what they see, then draw and colour the natural objects they found in their nature journals. Focusing on play, give students a chart with many colours on it and have them go on a colour treasure hunt, marking off each colour they find in nature as they walk through the trails. Stop along the way to discuss what the students discover, asking them to describe the colours, smells and textures (if safe to touch – pat don't pick. See activity # 8 regarding footprint).
Grades 1-3	Students colour and draw their natural objects and label them. An extension of this activity would be to assign each child a letter of the alphabet and have them find a natural object that starts with that letter, then draw and label. After the art activity have students compose a poem about their colour (and/or letter) and its matching object. Students share their poems with a partner. Students reflect on this experience, and what they have learned, in their nature journals.
Grades 4-7	After completing the matching activity, students create a postcard about their natural object including what it is, where they found it (habitat), and characteristics of the object. This will likely require that they use reference materials such as identification guides and/or community experts that have come along to share their skills with the students. Students then share their findings with their peers in small groups. To extend this activity students can write a poem or short story about their object. Students reflect on this experience, and what they have learned, in their nature journals. Students can also learn how Aboriginal people in BC used these plants and animals, including this information on their flashcards

Theme of Change: Students return to this activity in all four seasons and note the changes that have occurred through journal entries and their art. These artifacts of learning are kept in a portfolio so that students can compare them as the school year progresses.

Materials required: colour cards (such as found in paint stores), nature journals, flashcards, crayons/pencil crayons, identification guides for plants, insects, rocks, and animals.

Cognitive Skills:

*Community Connections***:** Naturalists, knowlegable parents, First Nations elders

*Skill Building***:** observation, communication, synthesizing, creating new knowledge, creativity

Assessment Opportunities:

- KG: oral communication with teacher
- Grades 1-3: colouring and labeling assignment; poems
- Grades 4-7: informative post cards; short stories

Days 2-4 (introductory stage to the following activities which continue throughout the year)

Activity #2

Special Place

(takes place over a longer period of time, ideally across all four seasons)

Have all students look for a special place to call their own. They start big, then go down smaller in size till they have chosen an area that is small as 10 cm x 10 cm. Once they have chosen a special place, students will draw a map to it that includes prominent land marks such as bridges, sign posts, trees, water etc…Once they have a land mark they should count how many steps there are from the landmark to their special place. The number of steps should be on their map.

Students will come up with a name for their special place, and a reflection that speaks to all their senses. How do they see, feel, hear, smell, taste their place? Additionally, students could write a story about and/or draw a picture of their place.

Students write an age-appropriate reflection in their nature journal, referring to the following prompts: What is special to you about this spot? What attracted you to it? Does this spot remind you of past moments, places you have been, or things you have read? What does it tell you about yourself? (questions are from "Get Outdoors")

When they are finished their maps, have them exchange maps with a different student to practice reading and following the map's directions.

Materials required: nature journals, pencil.

Multi-age considerations:

KG students will likely need help with their maps and choosing landmarks from teachers, parents, and/or older students. Instead of writing a story about their place, KG students could simply draw a picture of it or make a model of it.. KG students could also describe their special place, referring to all their five sense, to their teacher therefore allowing assessment of observation and communication skills.

Assessment opportunities (should be cumulative as the unit progresses, with formative assessment occurring through the unit and summative at the end):

- K: map/model (and verbal description of it)
- Gr 1-7: maps, pictures, journals

Skill Building: collaboration (in helping each other with the maps), communication (stories), creativity (pictures, poems, songs)

Next Step/Day

Students will find their special place using their map if required. Give them a chance to say hello to their place and get set up. Then have students measure out a 10 cm x 10 cm square and count all the different things they find. This should include plants, insects, dirt, rocks etc…Students could create a table that shows how many of each category they find and provide a brief description. Some pre-teaching in the classroom before going to the park will help students arrive with a bank of words they will likely need to use (moss, beetle, rock…)

Example:

Plants	Animals/Insects	Other
Moss – light green – lots	Beetle – big black – one	Rock – grey – two
Moss – dark green	Ant – brown	Dirt – brown

The chart could also be a pictograph, which would be more fun, more accurately account for what they are seeing, and allow some artistic expression. After they create the list encourage them to look at the space through the eyes of an ant. Using toothpicks students will mark spots within their square that the ant would use eg. leaf for shelter from the rain, mound of dirt for home. Challenge them to link everything in their list back to the ant somehow, see what food chains have been created. When they are done they can take each other on tours of the microtrails that they created in each of their spots (Acclimatization-Van Matre, 1972).

Materials required: ruler, string, toothpicks, nature journal, pencil, magnifying glass

Multi-age considerations:

KG students will need help with the chart/graph and may only be required to draw what they see, and maybe count how many of each thing. They could also verbally describe the characteristics of the things in their special place.

Assessment opportunities:

- K: oral descriptions of special place, pictures they draw
- Gr 1-7: graphs, tables

Next Step/Day:

Students say hello to their special place and have some time to simply experience and observe it before starting the following activity.

Students measure out a square metre of their special place, map it out with string, and do another assessment of what is there and how much etc…and make another table. Upon returning to school older students can create a bar or line graph comparing how much of each category they found, using the 10 cmx10cm and metre squared tables.

Students can also compose a poem or song about their special place and share with their peers.

Materials required: metre stick, string, nature journal, pencil

Assessment opportunities

- K: oral descriptions of special place, pictures they draw
- Gr 1-7: Graphs, poem, songs, journal entries

Skill Building: Observation, communication, creativity, critical thinking

Next Step/Day:

Theme of Change: Students go to their special place and notice anything that has changed. This will be an ongoing activity where students observe and record the daily, weekly and seasonal changes that affect their special place. The record can include art work, more traditional observations (tables, charts etc.), poems, stories etc.

Learning in depth project as extension of Special Place activity:

Possible topics include: moss, wild flowers, trees, slugs, beetles, ants, flying insects, ground cover, ferns, creek water, lichen, salmon, a type of bird, snakes, First Nations, logging, fishing, etc.

Students will learn about their topic at the park, the public library, and during their time at the school building (internet, books), and through community members with some expertise in on the subject. They will give presentations about their topic to their classmates and possibly other community members.

Part of the project will involve cataloguing the different kinds of moss, lichen or slug and how many of them there might be. How many square feet of moss do they think is in the park and how would they go about figuring that out? How best would one estimate the number of slugs?

Skill Building: research, accessing information, analyzing, evaluating and creating new knowledge, communicating

Assessment Opportunities:

- Presentations to peers and community
-

Community Connections: consultations with experts on their topic

Activity #3

Alphabet Book

This activity is for the Kindergarten students and continues throughout the year. Students use natural objects to form letters and then draw them in their alphabet book. They enforce their learning by writing the letters in their alphabet book and using natural objects as manipulatives. Students put natural materials back where they found them, learning responsibility and respect in the process. They can also hunt for natural objects that are already in the shape of various letters eg. slug in the shape of a C, to add to their book. Students can use simple words in their alphabet book. By the end of the year they have completed the whole alphabet.

Assessment:

- alphabet book

Activity #4

It's Math, Naturally

This activity is composed of several options:

Option A: Counting

This activity is for Kindergarten and Primary Grades. Students gather natural materials (without harming plants and animals) and use them as manipulatives for counting. They can also search for objects in nature that come in groups of 2, 3, 4 etc. such as compound leaflets or flower petals. They can make a number book similar to the alphabet one. Students put natural materials back where they found them, learning responsibility and respect in the process.

Option B: Shape and Space

Students are shown manipulatives/ examples of 3D objects and 2D shapes (complexity of these examples according to their grade) and asked to find them in the environment (natural or manmade objects in the park). Students are given prisms to study and observe how light travels through them. Older students (grades 5-7) can create their own kaleidoscopes out of old prisms or mirrors.Older students (grades 5-7) are given more complex shapes and taught to measure perimeter, area, length and volume using both manmade and natural objects. Students produce a mini booklet showing what they have learned.

Theme of Change: Students can make measurements of a fern throughout different stages of its life cycle during a year. They can record length of fiddlehead, stem, frond, pinna (leaves) and spores. Older students can compare changes in area, perimeter and volume.

Option C: Human Sundial (Grades 5-7)
From "Human Sundial Project from Evergreen, 2010". Students will observe how markers placed outdoors can cast shadows in different places throughout the day. From their observations they will learn to build an outdoor sundial by hypothesizing and experimenting with different variables. After compiling their data, students will present findings to other classmates, parents and teachers.

Option D: Creating Anemometers (Grades 4-7)
Students will design and create their own anemometers. A simple one can be created using an old protractor, fishing line and a ping pong ball. They will record wind speed and direction throughout the year and make graphs to represent the changes in the different seasons.

Option E: Puddle Contour Maps (Grades 3-5)
From "Map making with Children by David Sobel": Using a ruler students will record depth measurements in horizontal and vertical grids of a puddle. They will use these measurements to create a contour map on paper and then create one out of cardboard. They can make a map in each different season to see how rainfall changes throughout the year.

Assessment:

- mini booklet including formulas and examples used in the park
- maps, anemometers, student presentations

Activity #5

Cultural History of Cliff Falls

In this activity students will discover how humans have used this part of the park. First they will engage in a dramatization of what it might have been like to be a First Nation person on a spiritual quest at Cliff Falls. All ages will participate in the dramatization but have different follow-up extension activities. Before the dramatization students will hear a story (either an oral rendition or read from a book) to give them some context and ideas. Then they break into multi-age groups to put on their own dramatizations. Each group will present their mini-play to their peers. The picnic area in the middle of the falls provides a good location for this activity.

C*ommunity Connection:* If possible, have a member of a First Nations come and share a traditional story about the area and/or spiritual journeys and the importance of place to these journeys.

Multi-age considerations

Intermediate grades will produce a research report using book, internet, and community sources on a subject related to the cultural history of Cliff Falls and/or Kanaka Creek.

Skill Building: Collaboration, teamwork, communication, integration of technology

Assessment:

- All ages: dramatization as per performance arts PLOs

Extension of this activity has students creating a website about the history of Cliff Falls and Kanaka Creek in order to share their knowledge with the wider community.

Activity #6

Geologic and Ancient Natural History of Cliff Falls

Cycles of erosion through the sandstone canyon have revealed a deposit of fossils from 34-55 million years ago. Students can be taken to see these fossils at certain times of the year. Although these fossils cannot be removed, they can be drawn and the history of them studied through books, internet sources and local experts (such as professors from Simon Fraser University who have studied this fossil bed). Students can use fossils as a topic for learning in depth.

The canyon and the falls are great examples of how water erodes through rock over millions of years. There are many circular cauldrons formed when rocks were trapped in depressions and ground out the deep holes in the rock. Through inquiry learning students will learn about natural forces that shape the landscape and how the plants and animals have adapted, or gone extinct, due to these processes.

Community Connections: Guest speaker, expert on fossils of the area

Activity #7

Forest Studies with Children

From "Teaching Green: The Elementary Years"

This interdisciplinary collaborative group activity focuses on a forested area such as that surrounding Cliff Falls. It includes sensory activities, an in-depth study of a student-chosen tree, a consideration of interdependence in the forest and the impact of forests on our lives. It ends with a problem solving activity based on forest conservation.

As part of this extended activity students will produce a "Forest Sounds, Textures, and Sights" and "Our Adopted Tree" booklets or include these as part of their nature journals. They will also plant a garden in a large pot and monitor the growth of plants whose seeds they have collected. This part of the activity includes a lab that builds observation, data collection and math skills.

Skill Building: classifying, listening, observing, drawing, problem solving

Assessment:

- Self assessment of group work
- Journal entries and/or booklets
- Labs

Activity #8

Place-based Storytime

Adapted from "The Power of Stories" in "Teaching Green"

In this activity students read stories with their buddies, taking turns to read age appropriate materials (KG students can work on pointing out letters in the story their older buddies read to them). Stories will focus on plants and animals found in the Cliff Falls area, and include First Nations selections.

Students read while sitting in a quiet place in the park. After reading they will walk around the park looking for objects and creatures from the story. Then they can either draw what they find and/or write about it in their journals. Students in grades 1-7 can write their own version of the story, with changes based on what they find near Cliff Falls. Kindergarten and Grade 1 students can draw something they found and talk about it with their peers and teacher. The teacher can also include review of the alphabet and/or simple words with them at this time.

Teachers can choose to focus on many aspects of literacy in activities such as this. They may focus on grammar, meaning, decoding, vocabulary development, and/or composition. Stories provide and expand on experiences, offer relationships, lead to inquiry, breed stories, and foster imagination. Reading stories in the natural environment enriches the reading experience as it makes it easier for readers to connect literature to the real world.

Students could share their stories with the community by publishing them on the school website and/or submitting them to local publications.

Books are chosen based on their First Nations content, connection to place, and age appropriate reading level. These books could come from the school's portable library and/or the public library.

Skill Building: communication, teamwork, creativity, technology

Activity #9

Your Footprint

(from "Get Outdoors")

This activity emphasizes the fragile nature of many natural ecosystems, and the impact that humans can have just by walking through an area. It also promotes observation and categorization skills.

Students trace their foot on a piece of paper and then "walk" their footprint over an area, noting and recording all the plants and insects their foot would have "squashed."

Activity #10

The First Flute

(from “Keepers of the Animals”)

Students are read the Lakota story “The First Flute” and/or “Manabozho and the Woodpecker” (Anishinabe). Both stories are about the gifts that birds have given humans. Discussion of birds leads down many possible paths. Students can learn about how birds have adapted (changed) over millions of years, and have dinosaurs as their ancient ancestors. An investigation into the structure of bird feathers aids students in learning about the physics of flight and how humans have learned to fly by mimicking nature. In what other ways have humans mimicked nature? Questions about bird migration and seasonal adaptations open many doors into inquiry and project based learning centered around the theme of changes.

Games to enhance learning:

- Bird Song Bingo
- Pin the Beak on the Bird
- Avian Adaptations Match-Up

Extensions: Have students get involved in community projects that enhance and protect bird habitat. This provides yet another opportunity for students to make presentations to and educate the wider community using knowledge gleaned from their direct experience.

Activity #11

The Numbered Forest

(From “Teaching Green: The Elementary Years)

In this activity students assign numbers to trees, using prime numbers, factors, fractions, and decimals. Students can be sent on number searches, looking for numbers that meet certain criteria such as looking for multiples of 3, prime numbers etc. This activity can be modified to suit any math skill that needs developing at any age.

Students can also map the forest using the numbered trees, use tree ID guides to identify the numbered trees, and discover tree food webs.

Cliff Falls at Kanaka Creek

Overview Learning Outcomes:

Grade	Subject	Learning Outcomes (Skills Development and Strategies)	Big Ideas	Activities connected to Learning Outcomes
K	LA	Developing oral language (speaking and listening abilities) Developing reading and viewing abilities Developing Writing and Representing abilities	Literacy development	1 2 3 5 6 7 9 10
1-7	LA	• Use oral language to interact, present and listen • Use oral language to improve and extend thinking • Write and represent to create a variety of meaningful personal, informational, and imaginative texts • Use the features and conventions of language to enhance meaning and artistry in writing and representing • Use writing and representing to express, extend, and analyse thinking	• Speaking and listening • Writing and representing	1 2 5 6 7 8 10 12
1-7	LA	• Read and view to comprehend and respond to a variety of grade appropriate texts • Use reading and viewing to make meaningful connections, and to improve and extend thinking	• Reading and viewing	1 2 5 7 8 10

				12
K	Math	• Communication, connections, visualization, reasoning, problem solving, mental mathematics and estimation	• Numbers • Patterns & Relations • Shape & Space (measurement)	2 4 11
1	Math	• Arrangements up to 10 objects • Numbers in depth to 20 • Repeating patterns of two to four elements	• Numbers • Patterns & Relations	4 11
K-2	Math	• Attributes of 3-D and 2-D objects • Repeating patterns of two to four elements	• Shape & Space • Patterns & Relations	4
2	Math	• Data about self and others • Concrete graphs and pictographs • Even, odd, and ordinal numbers • Addition and subtraction to 100	• Statistics & Probability: Data Analysis • Numbers	2 11
3	Math	• First hand data • Bar graphs • Perimeter of regular and irregular shapes • Faces, edges, and vertices of 3-D objects	• Statistics & Probability: Data Analysis • Shape & Space	2 4 11
4	Math	• Many-to-one correspondence including bar graphs and pictographs • Rectangular and triangular prisms • Area of regular and irregular 2-D shapes • Addition and subtraction, multiplication, fractions • Decimals to hundredths	• Statistics & Probability: Data Analysis • Shape & Space: 3-D objects & 2-D shapes • Numbers	2 4 11
5	Math	• Perimeter & area of rectangles • Length, volume and capacity • Parallel, intersecting, perpendicular, vertical & horizontal edges & faces • Mental mathematics for multiplication • Decimal and fraction comparison • First-hand & second-hand data • Double bar graphs	• Space & Shape: Measurement and 3-D objects & 2-D shapes • Numbers • Statistics & Probability: data analysis	4 11
6	Math	• Perimeter and area of rectangles • Types of triangles • Regular and irregular polygons • Factors and multiples • multiplication and division of decimals • line graphs • methods of data collection • graph data	• Space & Shape: Measurement and 3-D objects & 2-D shapes • Numbers • Statistics & Probability: data analysis	4 11
7	Math	• Table of values and graphs of linear relationships • Properties of circles • Area of triangles, parallelograms and circles • Division, percents, fractions	• Space & Shape: Measurement and 3-D objects & 2-D shapes • Numbers • Statistics & Probability: data	2 4 11

		• Circle graphs	analysis	
K-7	Visual Arts	• Creating images for a variety of purposes • Using image sources such as imagination, observation and stories		1 2
K	Science	• Observing • Communicating (sharing)	• Processes and Skills of Science • Characteristics of living things • Surroundings	1 10
1	Science	• Communicating (recording) • Classifying	• Needs of living things • Daily and seasonal changes	1 2 4 10
2	Science	• Interpreting observations • Making inferences	• Processes and Skills of Science • Animal growth and changes • Air, water, soil • Properties of matter	1 2 6 10
3	Science	• Questioning • Measuring and reporting	• Processes and Skills of Science • Plant growth and changes	2 4 11
4	Science	• Interpreting data • Predicting	• Habitats and Communities	1 2 4 5 10
5	Science	• Designing experiments • Fair testing.	• Renewable and non-renewable resources	7 11
6	Science	• Controlling variables • Scientific problem solving	• Diversity of life	2 4 6

				7 10 11
7	Science	• Hypothesizing • Developing models	• Ecosystems	2 7 9 10 11
1-3	Socials	• Mapping skills • Cooperation • Gathering information • Oral and visual presentation skills • Problem solving	• Human and physical environment • Identity, Culture and Society	2 5 6 12
4	Socials	• Mapping skills • Cooperation • Gathering information • Oral and visual presentation skills • Problem solving • Critical thinking	• Aboriginal cultures, exploration and contact • Identity, Culture and Society • Human & Physical environment	1 5 8 10 12
5	Socials	• Mapping skills • Research skill development • Cooperation • Gathering information • Oral and visual presentation skills • Problem solving • Critical thinking	• Canada- from colony to country • Economy and Technology • Human & Physical environment	2 5 12
6-7	Socials	• Mapping and research skills • Cooperation • Gathering information • Oral and visual presentation skills • Problem solving • Critical thinking	• Human & Physical environment • Ancient Cultures • Canada and the world	2 5 12

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http://www.bced.gov.bc.ca/irp/welcome.php

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www.metrovancouver.org/about/.../**KanakaManagementPlan**.pdf

Evergreen, 2010- Human Sundial Project

http://www.evergreen.ca/en/lg/lessons/human-sundial.html

21st Century Skills:

http://www.21stcenturyschools.com/What_is_21st_Century_Education.htm

KEEPS website:

http://www.keeps.org/

Fossils:

Mathewes, Rolf W. (2005). Plant Fossils from the Kanaka Creek Beds, Southwestern British Columbia: Paleocene or Eocene? *Earth System Processses* 2 (8-11 August 2005). Accessed at:

http://gsa.confex.com/gsa/2005ESP/finalprogram/abstract_8840

Appendix 9

Place-based, Imaginative and Ecological Schooling

Theme Plan
Possible Year
Water: The Flow of Life

Allco Park
- Building relationships
- Reconnecting to the natural world
- Mapping: layers, the place, learning
- Water: interconnectedness of all things
- The Alouette River Story

Kanaka Regional Parks
Foreshore Park
- Continue relationship and community growth
- Water: living things
- Interconnection between the landscape and the creek
- Watershed: solving issues/problems relating to neighbourhood
- Water: stream, aquifer, and facet
- Kanaka ecosystem
- The salmon story
- Role that salmon play in both aquatic and terrestrial food webs
- Human interaction with Kanaka Creek and salmon
- Histories: Katzie and Kwantlen First Nations, Hawaiian settlers, logging operation, park

Kanaka Regional Parks
Fish Fence
- Exploration of fish fence: purpose
- Fish Counting: research
- Continuation of salmon story
- Interconnectedness and interdependency of natural world

Kanaka Regional Parks
Bell-Irving Hatchery and Cliffe Park
- Geological story of Kanaka Creek: fossil exploration
- Measurement of time
- Erosion
- Ecosystem development, nutrition and change
- Deciduous forest
- Riparian zone
- Kanaka Education and Environmental Partnership Society activity
- Hatchery exploration

Theme Plan Continued
Possible Year
Water: The Flow of Life

Council Chambers / Katzie First Nation Longhouse / Kwantlen Band Office

- Neighborhood
- Community
- Governance
- Local, provincial, national, global connections
- Local issues and problem solving
- Community connection to water and waterways

The Act, arts centre and theatre

- Local stories and histories, storytelling, drama
- Local music through time
- Local art through time
- Connections to culture
- Connections to waterways

Kanaka Regional Parks

Upper Conservation Area

- Changes in water flow
- Riparian zone
- Coniferous forest
- Drainage systems
- Logging operations and effect on water drainage
- Conservation

Blue Mountain Woodlot; BCIT Woodlot; Malcolm Knapp Research Forest

- Understand logging, ecosystems and ecological sustainability

CEED Centre

- Location in relation to histories
- Japanese histories
- Community/social/ecological asset mapping
- Environmental sustainability and development
- Food security and gardening
- Water restrictions

Fraser River system

- Kanaka Watershed's connection to the Fraser River
- The community's water
- Kanaka Creek, Alouette River, and Pitt River Stories
- The Fraser River Story
- Human connections
- Local fishing boats, canneries, and markets
- Story telling: Fraser River experiences

Appendix 10

Part 1

Educational Merits

Part 2

supporting research or cite models of "best practice"

Part 3

Short-List Bibliography / Literature Review

Part 1: Educational merits

Values

- Ecological Understanding
- Personalized learning: meets unique needs of the individual and community
- Project-based activity: deepens understanding, inquiry process and engagement
- Differentiated learning: builds success for all learners
- Leadership and Citizenship activity: strengthens student and community voice
- Place-based curriculum

Student learning

- Mental, physical, and spiritual health benefits
- Ethical development
- Decreased childhood obesity through active learning, physical activity, and play
- Increased self-esteem, self-discipline, sense of belonging, leadership and civic responsibility
- Increased motivation: restoration of attention
- Deeper understanding of concepts
- Enhances test scores and overall achievement

Educator network

- Mental, physical, and spiritual health benefits
- Deeper understanding of concepts
- Shared learning and Community
- Change and enhance practice

Maple Ridge

- A centre for environment and sustainability
- community health

Part 2: Research supporting the program direction or cite models of "best practice"

Research situates the proposed Environmental School Project in wider discussions around ecology and schools, environmental education, place-based education, green schools, eco-pedagogy, ecological learning, inquiry learning, problem-based learning, imaginative education, inclusivity, ecological inclusivity, and experiential education. The availability of positive and informational research related to these categories of thinking and action around "green learning" is extensive and is changing and growing constantly.

The extensiveness of the research that underlies the project, including literature that examines the effectiveness of environmental education in achieving curricular aims and objectives, demonstrates that this form of schooling will engage successful learners and take learners beyond academic outcomes.

Through the years and streams of influence one could follow writings by Rouseau, Vygotsky, and Dewey, and then educational research followers that have continued to engage educators in questions about education and pedagogy. Learning comes through experiences, the better the experiences … the more whole and in context learning occurs. All environments affect the learning that occurs. Examining all research through the ages leads to related fields of inquiry and "key works" of today, such as Bowers, Capra, Gruenewald, Orr, Smith, and Sobel to name a few.

By extension, what is proposed at Maple Ridge has an enviable pedigree. In cases too numerous to mention (yet smaller and involved in individual educational strands, activities, centres or classrooms), similar projects have succeeded and thrived. The evidence supporting this is well-researched and well-documented, and the educational practices that emerge from such schools/activities are effective, progressive, and likely to be at the forefront of educational practices in ensuing years. The learning results that may emerge at the interstices of the themes listed above, at a school such as the proposed one in Maple Ridge, are both significant and beneficial. Maple Ridge Place-based, imaginative and ecological schooling is unique, incorporating many encompassing possibilities in learning and teaching.

This literature review is divided into two parts. The first is the straightforward study of the related fields of inquiry, noted above, organized according to the streams of influence proposed for Maple Ridge. This section includes studies of similar schools. The second part is a study of literature relating to learning outcomes at environmentally-based schools.

In each section, a brief introduction to the meanings of the terms will be provided, distilled from numerous sources. Then a review of the literature relating to the terms will be provided. In the case of this version and recognizing the limited available time of members of the Board of Trustees, each section will finish with an 'if you were to read only one book or article' recommendation, under the heading "key works." References in the text to well-established claims have been intentionally removed for the sake of readability except where direct quotations are used. A large reference list is currently being compiled.

Part One: Some studies of the central informing themes of the proposed ecological learning centre and studies of Environmental Schools.

Theme one: Place-based education

Place-based education is a term popularized by David Sobel and others through the Orion Society, based in Massachusetts, in the early 1990's. Noted in the literature are the following characteristics: Education is conceived of as being not simply about the growth of the individual student, but also about direct benefit, often through real problem- solving, to the local community. Place-based education refers to both mode and focus of learning. What is local often is the subject of learning, but engaging with the local is also the way in which learning occurs. Beginning with the local influences how pedagogy is conceived. The literature notes how place-based education builds social and natural bonds by developing the capacity for schools to integrate into the welfare of nearby people and places, rather than to maintain isolation from them. Themes that go beyond the local are introduced by beginning with local subjects, people and places.

Place-based education emerged as a response to perceived discontinuities between local action and global thought. It was considered that a sense of powerlessness was affecting elementary school children when they heard about distant problems or unsolvable, global catastrophes. This, in turn, led to indifference or apathy. The literature around place-based education points to the suggested solution of beginning with local knowledge and to build outward. Place-based learning allows the place to speak to the interests of a curriculum. Simply encapsulated, place-based education is "the process of using the local community and environment as a starting point to teach concepts" (Sobel, 7).

Information will be organized in two groups: 1) Key works and 2) General theory and practice.

Place- and community-based education in schools

David Sobel

New York: Routledge. 2010.

Theory:

Place-based Education: Learning to be where we are.

Gregory Smith

Phi Delta Kappan (2002)

Theme two: Ecological/environmental education/green learning

Some have argued that an existing field of theory around environmental education has been in play since the time of Jean Jacques Rousseau, whose philosophy of education included broad condemnation of society's influence and an advocacy of return to less human-mediated structures. This might be true of Western culture, but it could be argued more persuasively still that considering the significance of Nature in learning has a far more storied history than this. One need only look to the significance of natural forces in great spiritual, philosophical, and religious texts from ancient times. Examples that

come quickly to mind in the context of Maple Ridge are creation stories of the Pacific North West, which often involved animal characters and places as more significant characters than human figures.

With respect to its more recent form, the literature around ecological/environmental education refers to the active engagement with nature in learning, where nature refers to aspects of the world less dominated by people. Aspects of educational involvement since the early 1900's noted in the literature include conservation education, pollution awareness, waste reduction in schools, and green focus in school design and operation. More recently, the literature points to attempts to engage students not simply in fixing what is "out there," but recognizing connections between themselves and the more-than-human world. This evolution of environmental education suggests a different orientation of school practices, from an objective stance to one in which activity and engagement in the world influences intellectual understanding. This later view of environmental education interconnects well with place-based community education. Environmental education also links to outdoor education, experiential education, and inquiry learning.

Key works:

Ecological literacy

David Orr

Albany: State University of New York Press. 1992.

See also ***Journal of Environmental Education*** for multiple works.

Theme three: Inquiry learning/problem-based learning

Inquiry learning is closely linked to experiential learning and to environmental learning. Recent literature modifies Richard Karplus's classic invitation-exploration-elaboration model to the "five E's" –engage, explore, explain, elaborate and evaluate—after the model proposed by Trowbridge and Bybee. The close connection to the natural world noted in the literature in much of inquiry learning is perhaps explained partly as simply affinity of interests between the two realms of learning. It is also possible that the kinds of processes that most readily lend themselves to inquiry learning may be most readily found in natural systems. Inquiry learning is nonetheless a justifiably stand-alone theme of investigation.

Key works:

Inquiry learning: Teaching for conceptual change in Environmental Education

Fletcher Brown

Green Teacher; summer, 2003; 71; CBCA Education pg. 31

Nine thousand straws: teaching thinking through open-inquiry learning

Jean Sausele Knodt

Westport CO: Teacher Ideas Press. 2008

Theme four: Inclusivity/ Ecological inclusivity / nature deficit disorder

The term *inclusive education* is well-known to members of the Board of Trustees. Relevant to issues of who can be included in public education systems and how they can be included, it probably needs little explanation. However, *ecological inclusivity* extends the idea to include nature. In so doing, it recognizes the unmet need of many (some would say all) children to be involved in the workings of non-human systems. In the literature, Richard Louv and others claim that part of healthy intellectual, emotional and physical development includes interactions with the more-than-human world. Thus, the establishment of a learning centre with the environment as its focus may be viewed as of service to all children in a public system, but also as a necessity to some. Viewed as part of the overall inclusivity discussion, a school that addresses this need may be viewed as proactively oriented toward the unmet needs of some children.

The literature also notes the attempt to construct, as a form of literacy, knowledge of nature. In the early 1990's, David Orr and Fritjof Capra coined the term *ecological literacy* to refer to the ability to understand the living world.

Key works:

Last child in the woods: saving our children from Nature deficit-disorder

Richard Louv

Chapel Hill, NC: Algonquin books of Chapel Hill. 2005

Theme five: Experiential education

The origins of considering experiences as crucial to learning are found in John Dewey's writings of the late nineteenth and early twentieth century. In *Experience and Education*, Dewey sought to debunk the misapprehension that because any activity can be viewed as a kind of experience, any experience is a good one. This Dewey saw as the error of what he called "progressive" educators, in opposition to "traditional" ones, who favoured autocratic modes of instruction. Dewey sought to lay the groundwork for what constituted an *educative* experience. In Dewey's view, experiences are educative when the principles of interaction (between student and broader environment) and continuity (between the starting point of the student and where they are to get to) occur.

More recently, the literature theorizing around experiential education has focused on the process of an experience, beginning with a framing of the experience and completing with the debriefing of the experience, ideally resulting with the student being in the right state for the next experience. In general, experiential education relies on a central experience that is the core of learning. Not merely the "head," but also "heart" and "hands" are involved in learning. Often, experiential education is linked to both outdoor and environmental education. The connection to inquiry learning is also evident. The literature reveals subtle differences between experiential *education* and experiential *learning*. In either case, an experience is central to learning.

Key works:

Experience and education.

John Dewey

West Lafayette, IN: Kappa Delta Pi. 1998

The theory of experiential education.

Karen Warren, Mitchell Sakofs, Jasper Hunt, Eds.

Dubuque, IO: Kendall Hunt. 1995.

Part Two: Learning outcomes in environmental/place-based/green education and existing school board-approved environmental education programs, initiatives, and streams.

The literature is rich in this area, in theoretical expectations (see Warren and Sakofs, noted above), in critical case studies and in public school integration of environmental learning within classic curricula, noted below. The literature is also thick with explorations of both academic and non-academic outcomes.

Perhaps most striking amongst the literature in this area are the available data on existing school board-approved programs in environmental education. Several weblinks are available, listed below. Perhaps of greatest significance for this project are the expectations in certain school boards and in some cases, province wide, that the environment will be "streamed" into almost all aspects of curricula.

Starting points for reference include:

Ladwig, *Beyond academic outcomes,* in Review of Research in Education, 2010.

The Ontario Curriculum Grades 1-8, Environmental Education.

www.edu.gov.on.ca/eng/curriculum/elementary/environ18curr.pdf

or

http://www.edu.gov.on.ca/eng/curriculum/elementary/environment.html

Acting Today, Shaping Tomorrow (Ontario Min of Ed report on Environmental Education: 32 recommendations included)
http://www.edu.gov.on.ca/eng/teachers/enviroed/action.html

Ontario Ministry of Ed publications related to environmental education
http://www.edu.gov.on.ca/eng/teachers/enviroed/publications.html

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