THE WONDER OF WATER:

DIGITAL LITERACIES AND ENVIRONMENTAL CHANGE

by

HÉLÈNE M. MOÏSE

Diploma in Ed. Simon Fraser University, 2006

B.Ed. (Ed. Major, French Major) Simon Fraser University, 2006

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"Never doubt that a small group of thoughtful committed citizens can change the world: indeed it's the only thing that ever has" (Margaret Mead).

ABSTRACT

As we can no longer ignore the emergency of the wounds we have inflicted on the health of our ecosystems, there has been a growing concern to integrate environmental issues in the school curriculum. The United Nations declared 2005-2014 to be the decade for Education for Sustainable Development, which intends to bring to the forefront the role of all teachers to integrate the principles, values, and practices of sustainable development in the classroom. Teachers play a crucial role in empowering students to become environmentally responsible. Based on the work in New Literacies, digital literacies, language and identity, and indigenous knowledge, this Capstone paper, which is particularly concerned with the state of the worlds' fresh water supplies, explores how a multimodal curriculum can be adapted to integrate learning for environmental change. The curriculum (The Wonder of Water) developed as part of the Connection to Practice component of this project was inspired by my involvement with the organization Learning for a Sustainable Future, which aims to educate teachers on the meaning and importance of engaging students in sustainable action projects. This curriculum will demonstrate how digital literacies and Education for a Sustainable Development can come together to create an empowering learning experience for students that can enable them to add unforeseen colors to the landscape of ideas and to take actions to heal our worlds' water.

CONTENTS

TABLE OF CONTENTS

| Abstractii |
|--|
| Table of Contentsiii |
| Acknowledgementsv |
| SECTION 1: INTRODUCTION1 |
| Motivation1 |
| Theoretical Framework |
| The first model |
| Moving forward: curriculum review& renewal |
| SECTION 2: LITERATURE REVIEW |
| New Literacies |
| Language and identity12 |
| Indigenous knowledge and ecological literacy and16 |
| Implication for practice: Digital literacies & the environment19 |
| Conclusion |
| SECTION 3: MAKING CONNECTIONS24 |
| SECTION 4: CONCLUSION |
| Spreading the word & future plans40 |
| REFERENCES42 |
| APPENDICES:47 |
| Introduction to LTP47 |

| Thinking like a photographer: lesson plan | |
|---|----|
| Thinking like a photographer: activity sheet | 49 |
| Brainstorm on family and water | 50 |
| Creating a water shot list | 51 |
| Watersheds | 52 |
| What would you condone | 54 |
| Types of action projects and ideas | 56 |
| Research activities | 61 |
| Research activity worksheet | 62 |
| Research analysis | 63 |
| Project planning | 64 |
| Assessment rubric for water issues action project | 69 |
| Assessment rubric for Mind Map | 70 |
| Features and convention of language | 71 |
| Student self assessment sheet | 72 |
| Additional resources | 73 |
| Suggested readings | 79 |

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SECTION I: INTRODUCTION

"If you are thinking a year ahead, sow a seed If you are thinking ten years ahead plant a tree. If you are thinking one hundred years ahead, educate the people." (Kuan Tzu, Chinese Poet, c. 500 B.C.)

Motivation

This redesigned version of the curriculum *Literacy Through Photography* (LTP) is what I will consider my stepping stone when leaving the world of academia to embrace a new journey into the world of practice. This Capstone project was shaped by my involvement with the United Nations Decade of Education for Sustainable Development and by the re-articulation of my thinking on Education, which occurred in the time and space of my graduate studies at the University of British Columbia (UBC). The combination of these two experiences has led me to replay and resignify the theoretical positions that have defined me, allowing me to redesign a curriculum that takes into account the possibilities of their convergence (Morgan, 2004).

In Canada, the United Nations Decade for Education for Sustainable Development (UNDESD), under the umbrella of the United Nations Educational, Scientific and Cultural Organization (UNESCO) designated the office of Learning for a Sustainable Future (LSF) at York University to take over the mission of promoting, through education, the knowledge, skills, perspectives and practices essential for a sustainable future (LSF, n.d.). As part of this mission, I was recruited and trained by LSF to be part of a pan-Canadian team of teachers whose task is to provide educators with access to pedagogical resources that demonstrate the interplay among the dimensions of sustainable development, such as the environment, economy and social forces. The first year of the project was spent reviewing teaching resources that were made accessible

online on the LSF *Resources for Rethinking* database. As the team entered its second year, our role as reviewers shifted towards presenting the LSF database at various Education conferences. As part of this new role, I was also trained to present and design workshops for teachers on engaging students in sustainable action projects.

This recent professional engagement with LSF came at a time when I was deeply involved in graduate work, and it became clear to me that the goals and objectives of LSF were consistent with the changes that were occurring in my thinking, particularly as it pertained to children's use of various sign systems, such as photography, to represent complex ideas.

Theoretical framework

My graduate studies at UBC acquainted me in more depth with the theoretical framework adopted for this Capstone project. Based on Vygotsky's (1978) sociocultural theory, I further developed my beliefs about the various ways in which children create meaning about the world. Vygotsky's (1978) views that children's learning is co-constructed with others before being internalised, and that children's learning needs to be situated culturally and socially, informed my understanding of children's use of digital mediums, particularly photography, as it pertains to literacy and children's understanding of the world.

The New London Group (2000) maintains that we have to expand the traditional definition of literacy to first "account for the context of our culturally and linguistically diverse and increasingly globalised societies; to account for the multifarious cultures that interrelate and the plurality of texts that circulate"(p.9). Second, they argue that: "literacy pedagogy now must account for the burgeoning variety of texts forms associated with information and multimedia technologies" (New London Group, 2000, p.9).

Hence, the development of the curriculum *The Wonder of Water* adopted an expanded definition of literacy through which children were able to construct meaning using a variety of mediums such as photography and the creation of a blog. The concepts of New Literacies, digital literacies, and language and identity (Bawden, 2008; Gilster, 1997; Kendrick & Jones, 2008; Norton, 2000; Knobel & Lankshear, 2008; Millard, 2003; Orr, 1992; Rogoff, 2003; Schratz-Hadwich,, Walker, & Egg 2004) informed my understanding of the ways visual images could influence children's writing and knowledge of the world.

These concepts made me aware that my previous conception of literacy was constrained to printed texts, thus, possibly limiting my students' opportunities to become successful learners. Through passionate conversations with peers, colleagues, and professors, I was able to coconstruct and re-articulate an expanded view of literacy and redefine my beliefs that had previously shaped my teaching (Norton, 2000). This re-articulation of literacy impacted my teaching practices and created more opportunities for students to make meaning and creatively represent what they know. The interplay between many meaning-making resources (e.g., language, colour, music, gesture, drawing, music, etc.) or multimodality was the start of a transformative journey for my students and me, as we began the first version of the curriculum *Literacy Through Photography*.

The first model

Literacy Through Photography was first developed by Wendy Ewald: an artist-inresidence at the John Hop Franklin Center and a research associate at the Center for Documentary Studies at Duke University. Incidentally, she is the young teacher portrayed in the movie "Born into Brothels." Ewald coauthored I Wanna Take Me a Picture: Teaching Photography and Writing to Children with Alexandra Lightfoot, a PhD graduate from the School

of Education at Harvard University. Based on their book, I first adapted the program to fit the Grade 7, BC English curriculum and to better suit the needs of my students. As described by Ewald and Lightfoot (2001), the goal of the program was to let the children speak for themselves and to allow them to be active observers of the world through their own lenses in order to allow writing to flow from their own voices. The first version of the project included the teaching of photography techniques and terminology and was developed according to four main themes: self-portrait, family, community and dreams. In this version, the students had to complete a final project in which they were responsible for creating an exciting format for the presentation of their work that would take place during a community exhibit. However, this part of the project did not happen since time and the organization of their "Grade Seven Farewell" caught up with us.

Overall, *Literacy Through Photography* provided students with an alternative mode of meaning making, and as discussed by Early (2008), the results demonstrated the power and the strength of students' engagement in the project. Through my students work, I was able to observe creativity, engagement and depth in their writing. Most students demonstrated a unique voice and an ability to write meaningful and logical sequences. Perhaps their success can be explained by both the multimodal and prevailing power relation, which allowed students to engage their own voice with the world and offered them the opportunity to have an equal opportunity of outcome in this particular program (Norton, 2000).

The concept of multimodality discussed by scholars such as Harste, Woodward and Burke (1984), Kendrick, Jones, Mutonyi, & Norton (2006), Kress (1997), and the New London Group (2000), unravelled ways to connect a wider variety of meaning making systems and expanded my own conception of literacy. Weedon (1987) stated: "the political significance of

decentring the subject and abandoning the belief in essential subjectivity is that it opens up subjectivity to change" (p.33). As discussed by Morgan (2004), who we are and how we re-script ourselves as individuals and teachers is reflected on our students and, subsequently on the world. A student represented this concept during the LTP project as followed: "We can all be who we are because people are people through people! We understand the world around us according to people" (personal communication, June 2, 2006).

Based on the notions of New Literacies, LTP offered many opportunities for students to explore new ways of meaning making through the mode of photography. Like drama, photography provides an opportunity for students to integrate the body and the mind and to explore ways of producing meaning in a picture through the position of the body and the objects in the frame (Cummins, 2006). One student stated: "I feel that the way we place ourselves in the picture can really change the emotions, messages and perspectives of the photograph" (personal communication, June 2, 2008). Hence, through this mode of meaning making my students were able to represent their visual thinking and to place reality in their own perspective.

Throughout the program, students were also encouraged to reflect about themselves, their values, and their communities. Further to this, they had to negotiate language in particular ways, and this widened their window to identify with the world (Kendrick, Jones, Mutonyi, & Norton, 2006). *Literacy Through Photography* guides students to establish a relationship with their social world: it integrates the language learner and the language learning context, an element which, as argued by Norton (2000), has not been addressed by Second Language Acquisition (SLA) theorists. Photography allowed students to claim ownership and gave their audience an investment in the text through both their photographs and their writing (Norton, in press). In the self-portrait unit, one student wrote: "I found that the garden was a suitable background that

reflected a piece of my personality, so many different components brought together to form an amazingly intricate whole" (personal communication, June 2, 2008). This student demonstrated an ability to bring the outside world into her own identity; she created her own identity-text (Morgan, 2004)

By integrating LTP to my English program, I created an opportunity for my students to use a mode with very few constraints that could set free their imaginations. Through this mode, I was able to witness their unique voices and identities, which was one of the many rich rewards gained in this project. I now wish to take this curriculum further and to adapt it to create with my students a community of active citizenship with a mutual kind of learning centred on environmental change.

Moving forward: curriculum review & renewal

As part of the United Nations Decade of Education for Sustainable Development, the organization of Learning for a Sustainable Future aims to educate teachers on the meaning and importance of teaching for a sustainable future and ways in which they can engage students in sustainable action projects. With this goal in mind, I wanted to create a multimodal curriculum for environmental change that would demonstrate the interconnectedness of various theories and disciplines.

The adapted version of LTP, titled *The Wonder of Water*, is an interdisciplinary curriculum that uses photography, among other forms of digital mediums, to engage students with the world and their writing. Its mission is to help lead educators into the 21st century by engaging learners with the language learning process (Norton, 2000) via digital literacies and an environmental approach that guides learners to interpret and change the world through their own lenses. The purpose of this curriculum is to guide children to speak for themselves; to guide them

to become active observers of the world through their own lenses and to open up opportunities for writing to flow from their own voices.

Hence, this Capstone paper will research how a multimodal curriculum using digital photography can be adapted to integrate learning for environmental change in the classroom. It does so by looking at the efficacy of using digital photography, and other forms of digital literacies such as the creation of a blog, through what the literature reveals about New Literacies, digital literacies, language and identity, and Indigenous knowledge. It will also look at the implications for practice of the best principles of education for a sustainable development. These multiple concepts shaped the adaptation and creation of *The Wonder of Water* that was developed as part of the "*Connection to Practice*" component of this project. This new curriculum strives to empower students to add unforeseen colors to the landscape of ideas and to take actions to heal the state of our worlds' water.

SECTION 2: LITERATURE REVIEW

"I found that the garden was a suitable background that reflected a piece of my personality, so many different components brought together to form an amazingly intricate whole" (Elementary Student).

Throughout history, humans have embedded their stories in various systems of meaning making in order to reach beyond what languages alone are capable of expressing. Up until the 15th century, when Gutenberg invented the printing press, architecture was the big book of humanity. Architectural patterns documented big ideas and current philosophies and a well-designed building could be compared to poetry as it could be interpreted at different levels that go beyond language itself (Nair & Fielding, 2005). Since the printing press, literacy has taken over all other forms of meaning making, leading the way to an educational focus for developing students' ability to understand and decode printed texts. However, arts, films, music, movements, gestures, dance, photography, and much more, all convey different meanings encoding distinctive ways of knowing that are also of importance and show rationality, logic, human desire and affect (Kress, 1997). As language is not enough to express the complexity of human society and the means by which meaning is constructed, scholars are reconceptualizing a view of literacy which considers the importance of a variety of modes of communication and representation (Eisner, 1991; Kendrick & Jones, 2008; Kress, 1997; New London Group, 1996).

To talk about literacy as if it were a single skill applicable to all forms of text is to underestimate the special demands that different forms of language exact (Eisner, 1991). This literature review will take a particular look at the mode of digital photography, as a way of knowing. The literature that has helped me conceptualize this project is drawn from the work in New Literacies, digital literacies, language and identity, and Indigenous knowledge. This project

also considers the implications for practice of the best principles of Education for Sustainable Development. As such, it adopted the United Nations definition of ESD:

Education for sustainable development is about learning to: respect, value and preserve the achievements of the past; appreciate the wonders and the peoples of the Earth; live in a world where all people have sufficient food for a healthy and productive life; assess, care for and restore the state of our Planet; create and enjoy a better, safer, more just world; be caring citizens who exercise their rights and responsibilities locally, nationally and globally (UNDESD, n.d).

These multiple concepts shaped the adaptation of a multimodal curriculum for environmental change, titled *The Wonder of Water*, which was developed as the "*Connection to Practice*" component of this Capstone paper.

"How can I talk to you about my winter land when you only have one word for snow and I have fifty three" (Sigh of an Inuit, source unknown).

New Literacies

Various academics such as Eisner (1991), Kress (1997), the New London Group (1996), Van Leeuwen & Jewitt (2001) have been making the claim for a new way of defining literacy. Traditionally, literacy pedagogy was bound to the standard forms of reading and writing printed text (New London Group, 1996). Yet, it has been argued that this conceptualization of literacy pedagogy was too restricted and marginalized other modes of meaning making that are not "rulegoverned forms of languages" (New London Group, 1996, p.1). Therefore, in order to waive the restrictions imposed by the previous definition of literacy pedagogy, the New London Group (1996) maintains that we must expand our definition of literacy to "account for the context of our culturally and linguistically diverse and increasingly globalised societies, and to account for the multifarious cultures that interrelate and the plurality of texts that circulate" (p.1). The expanded definition of literacy lays the foundation of multiliteracy, a concept which calls for the development of students' ability to encode and decode meaning in all forms embedded in society (Eisner, 1991). Moreover, to limit our view of literacy to printed text would go against the mission of Education if one believes and wishes to work towards an Education system capable of leading students to a full and equitable social participation (New London Group, 1996). Kress (1997) stresses the importance that as educators, if the limitation to one mode of representation is a limitation, then we should do everything we can to overcome that limitation. Kress (1997) asserts:

The force of my argument is to suggest that there are best ways of representing meanings: in some circumstances language may be the best medium; in some a drawing may be; in others colour may be the most apt medium for expression. (p.38)

Moreover, Kress (1997) claims that the ability to decode visual design is as important as decoding words since each mode has its limitations and possibilities, where one can help fill the gap that the other leaves behind; each medium offers a unique and different dimension of interpretation. For instance, Swanson (2008) gave the example of an African community which used to learn multiplication through chanting but this medium was taken away in favour of what they believe to be a more "progressive" education. However, by taking away this meaningful mode of meaning making, students' mathematical results started to decline (Swanson, 2008). This example demonstrates that it is to the benefit of all students that we, educators, do not underestimate other modes of meaning making, and that we embrace other modes that are just as demanding and rewarding (Swanson, 2008).

The Wonder of Water, the adapted version of Literacy Through Photography, emphasizes visual modes of communication and expands its literacy pedagogy by adopting a view of

multiliteracy based on the insights of scholars such as Harste, Woodward and Burke (1984), Kress (1997), New London Group (2000), Rogoff (2003), and Vygotsky (1978). Here is a summary of the literacy view adopted in this Capstone project:

Multiliteracy is how we make sense of the world by analyzing, understanding, and reacting to incoming information using our five senses. It also encompasses the development of one's ability to write and read all forms of print and media. Views of multiliteracy depend on the sociocultural, economic, environmental, and cultural contexts, as well as the specific period in time in which it is experienced.

In addition to adopting the above view of multiliteracy, *The Wonder of Water* emphasizes the use of photography as a medium of knowing, as well as other forms of digital literacies such as the use of photo editing software and the creation of a blog on Wordpress. This Capstone project adopted a view of digital literacies based on the work of scholars such as Bawden (2008), Eshet (2002), Gilster (1997), and Lankshear and Knobel (2008) that can be summarized as follows: digital literacy is the set of attitudes, understanding and skills to handle and communicate information and knowledge effectively, in a variety of media and formats.

In this view, to be digitally literate is more than knowing a certain set of skills; it is also a way of thinking critically about what you see on a digital medium (Bawden, 2008). *The Wonder of Water* does so by expanding text created by students; it brings together photography and editing, video and image analysis (posted on the blog and in the classroom), drawing and story-telling (in a scrapbook), and other forms of arts such as painting (Buckingham, 2008). *The Wonder of Water* goes beyond the teaching of media skills by guiding students to reflect on the ways media works and addresses questions about the selection, manipulation, and combination of images (Buckingham, 2008).

Furthermore, digital literacies, such as photography, learning how to use editing photo software, and blogging, convey different meanings encoding distinctive ways of knowing that are just as valuable as generally held views of literacy (Kress, 1997). Eisner (1991) maintained that language itself is not enough to express the complexity of human society and the means by which meaning is constructed. For instance, with photography, we are able to see the data and this, as maintained by Schratz-Hadwich, Walker, and Egg (2004), turns the data into visible knowledge of individuals which can then be shared, discussed or questioned; they refer to this as "knowledge in the making" (p.6). Like Eisner (1991), Schratz-Hadwich, Walker, and Egg (2004) also discuss how photography is a mode of meaning making which has the potential to bring out different interpretations of reality since a picture can also bring forward details that may have otherwise appeared unimportant. Capello and Hollingsworth (2008) further add that the act of photographing brings new ways of problem solving and creates more complex texts while enlarging the expanded meaning.

The Wonder of Water fits well with the views of New Literacies; it parallels the New London Group (2000) argument that literacy pedagogy must emphasise innovation and creativity by: "supporting a pedagogy that views language and other modes of representation as dynamic, constantly being remade by meaning-makers in changing and varied contexts" (New London Group, 2000, p.12). The digital mediums integrated in the curriculum also create new possibilities for accessing, producing, sharing and reusing information (Erstad, 2008). The next section will explore the meanings of these new possibilities on learners' identity.

"But there is also another sense in which seeing comes before words. It is seeing which establishes our place in the surrounding world; we explain this world with words, but words can never undo the fact that we are surrounded by it" (Berger, 2008).

Language and identity

Norton (in press) maintains that the use of photography in the classroom can offer students the opportunity to gain the right to speech and the power to impose reception. In this visual space, through the aid of photographs, students are encouraged to no longer be subject "of" or subject "to" the world. With photography, students can let the world become their subject since this medium offers them a different position of interaction with the world (Kendrick, Jones, Mutonyi, & Norton, 2006). Ewald and Lightfoot (2001) also discuss this concept in their book *I Wanna Take Me a Picture: Teaching Photography and Writing to Children:*

Photography is perhaps the most democratic visual art of our time. For most of us, picture taking is part of our family lives. We don't need a particular talent, like the hand-eye coordination necessary for drawing, to render what we look at. Even children and adults unfamiliar with photography can make photographs of what they see and imagine. For those of us who have used cameras, photography offers a language that can draw on the imagination in a way we may never have thought possible before; children eagerly harness it to the engine of their imagination. (p.14)

Through their photographs students have the possibility to reclaim where they belong in the world (Kendrick et al., 2006). Digital photography is also easy to use and the data being collected can be rapidly displayed. Schratz-Hadwich, Walker, and Egg (2004) maintain that these properties make it impossible for adult and expert language to "overrule and the images look beyond stereotyped phrasing" (p.5); making "individual expertise visible to others" (p.5). As maintained by Norton (2000), the power to impose reception is of first importance in power relation and a photography project for children might be doing just that.

Furthermore, the first version of *Literacy Through Photography*, previously discussed in this paper, has been done in similar ways around the world in inner city schools and developing countries (Ewald & Lightfoot, 2001; Norton, in press). Many projects report how children, with the aid of photography, gained a sense of ownership and a place from which to speak (Kendrick et al., 2006). For example, in the self-portrait unit of the first version of *Literacy Through Photography*, students were challenged to take a picture of the person deep inside of them; the person nobody knows. Based on their picture, they then had to write a description that would tell their audience, such as their peers, teachers and parents, something important about them that was represented in the picture. The following is an illustration of the type of response I encountered:

I have not yet completely understood myself, found myself, and so silently, I asked: how can anyone show who they are in a photo, when they don't even know it themselves? I suppose I could show myself doing an activity which I enjoy, but I'd have to really love doing it, or else it wouldn't really actually be representing me, would it? So hard to know... Eventually, I decided the simplest approach would have to do. I went with the flow, instead of carefully planning every single detail. I jumped right into it, and was rewarded with a work of great honesty that is truly my own. (personal communication, June 2, 2008)

Moreover, Morgan (2004) maintains that "what happens in the classroom has the potential to challenge or maintain the power structures in society" (p.173) and she argues that photography has the ability to diminish the unequal power distribution between adults and children (see also

Schratz-Hadwich et al., 2004). By offering students the opportunity to speak for themselves, *Literacy Through Photography* and *The Wonder of Water* challenge the power structures in society which do not allow for children to claim their own voice. By taking pictures, students are "letting the world in rather than simply being heard by the world" (Potts, 2005). Schratz-Hadwich, Walker, and Egg (2004) explain that when students explore their environment by taking pictures, discussing and reflecting on them, the gap between learning questions and life questions collapses: "In trying to find the unknown in the known and to sense where relationships exist between their school world and their world of feelings, their own views begin to count. What is important is how they feel" (p.8). This is made possible because what students see through the lens of their camera demonstrates the interplay between multiple dimensions of the environment, emotions and associations (Shratz-Hadwich et al., 2004).

Barbara Rogoff (2003) discusses how people develop an "understanding of their world through active participation in shared endeavours with other people as they engage in sociocultural activities" (p. 236). She thus emphasizes the importance of engagement and action in the community, which can relate back to Vygotsky's (1978) cultural historical theory, which holds that individual cognitive skills derive from people's engagement in sociocultural activities. Rogoff (2003) also asserts that: "an integrated approach makes it much easier to understand how thinking involves social relations and cultural experience, without an artificial separation into isolated parts" (p.237).

Furthermore, Kress's (1997) educational approach explains that meaning-making is closely related to children's own experiences with the world since learning is built upon your own experience, knowledge and interest. Similarly, Capello and Hollingsworth (2008) believe that "when constructing multimodal texts, meaning makers intentionally choose media with which they are familiar, and/or the media that will enable them to say what they want to say" (p. 445). *The Wonder of Water* creates opportunities for students to have access in the classroom to their literacy practices and ways of knowing. My students have been taking pictures for years and enjoy the use of technology in the classroom; they also like to have the opportunity to include images as an addition to their essays.

The Wonder of Water also integrates the students' home and school by encouraging students to take pictures and document water usage at home and in their community outside the school; they bring back the outside world inside the classroom and build on prior learning (Early, 2008). Students and parents are also encouraged to participate and create multimodal postings on the classroom blog. Hence, these practices offer opportunities for students to engage their social identities and help improve their language skills outside the classroom while recognizing their authorship (Kendrick et al., 2006).

"It is time to ask what we need to know to live humanely, peacefully and responsibly on the Earth, and to set our priorities accordingly" (Orr, 1992).

Indigenous knowledge and ecological literacy

The Wonder of Water aims for the development of an ecological consciousness that is now critical if we are to ever heal the wounds we have inflicted on the health of our ecosystems. Eurocentric worldviews have much to learn from many Indigenous¹ worldviews in regard to protecting Mother Earth (Battiste, 2002). The goal is to infuse, in *The Wonder of Water*, Indigenous worldviews that are grounded in the environment and that reflect behaviour that does not harm the sustainability of our ecosystems (Suzuki, 1997). Understanding the forces of nature and the balance between all of its elements is at the core of most Indigenous worldviews and

¹ While this project acknowledges Indigenous views, it is not intended to romanticize their cultures but rather to provide some of the main ideas regarding their worldviews.

languages (Henderson, 2002). While Pesco and Crago (2008) acknowledge that Indigenous people are culturally diverse, they also state that "they are bound together by a sacred tie to the land, a value of communal interdependence and a holistic worldview" (p. 274).

The concept of the "Indigenous language of the land" is similar to the theory of ecological literacy discussed by David Orr (1992). In Orr's (1992) view, ecological literacy includes not only the ability to write and read, but also the ability to use numbers with an understanding of what is countable and what is not; the ability to observe nature with insight and to understand the "intricate history of one's life on the land" (Orr, 1992, p. 86). For Indigenous people, ecological literacy speaks of an "affinity with the living world" and a "kinship with life" (Orr, 1992, p. 86). Contrary to the Eurocentric worldviews, which take everything in nature for granted, many Indigenous people have the knowledge to work in harmony with the environment, and their behaviour does not harm the future of local ecosystems essential to all life (Suzuki, 1997). Much Indigenous people do not perceive humans to be superior to nature, instead, they perceive humans to be an element that is dependent upon all forces of nature for survival.

Learning to read the land was at the centre of Indigenous spiritual, social and economic systems (Hare, 2005). Henderson (2002) explains that Indigenous worldviews are in a constant process of transformation which attempts to follow a circular interaction of the forces of Nature. Hence, he maintains that their languages: "express an awareness of a local ecology and are directed to understanding both external life forms and the invisible forces beneath them" (p.262). Orr (1992) wrote the following about the language of nature:

The language of nature includes the sounds of animals, whales, birds, insects, wind, and water – a language more ancient and basic than human speech. Its books are the etching

of life on the face of the land. To hear its language requires patient, disciplined study of

the natural world. But it is a language for which we have an affinity. (p. 91) Similarly, Indigenous languages and thoughts are developed in an attempt to contain the forces of nature. These languages help Indigenous people to become a part of an active cycle which creates harmony between them and nature. For instance, Cajete (2002) talks about a certain figure called Kokopelli of the Pueblo people, which is a symbol they have created to represent the procreative processes and energy in nature. He explains:

We came to know the nature of water and of land. Some of these stops were by sacred waters that are so important in a desert environment like New Mexico. We came to know the importance of water for our life and our well-being. We began to reflect that understanding in a variety of ways, and we began to evolve technologies based on our growing understanding of the elements within our environment. (p. 183)

Battiste (2002) also adds: "As Aboriginal² peoples of this land, we have the knowledge to enable us to survive and flourish in our own homeland. Our stories of ancient times tell us how. Our languages provide those instructions" (p. 202). Cajete (2002) and Battiste's (2002) statements reflect well the extent to which Indigenous languages are intertwined with their relationship with the environment.

Furthermore, *The Wonder of Water*, in addition to integrating the best practices of Education for Sustainable Development (ESD), is infused with worldviews that are particularly similar to the Indigenous views of education. It also parallels the goals of ecological literacy, which encourages a sense of wonder, beauty and mystery in relation with nature along with the

² "Indigenous" and "Aboriginal" is used interchangeably.

knowledge to understand the interconnectedness among all things and the ability to demonstrate care (Orr, 1992).

The following table represents the similarities between some Indigenous views of Education and ESD.

| Indigenous Education (Battiste, 2002; Cajete, 2002; Henderson, 2002) | Education for a Sustainable Future (Learning for a Sustainable Future, n.d) |
|--|--|
| Multimodal: story-telling, dance, songs, rituals | Multimodal: encourages different modes of learning |
| Experiential: learning & living are interconnected | Experiential: action project where students have to take actions in the community |
| Strong connection to the land | Encourages the development of compassion for all living and non-living things |
| Spirit and heart | Encourages students to clarify their values, develop compassion and respect for all |
| "Hamatowin" Cree word for communal learning (learning happens in connection with the Earth, creator and elders) | Encourages students to connect with the community and the Earth by going outdoor |
| Multiple perspectives and critical thinking: one has to listen to multiple stories and reflect on them to think of an answer to their question | Multiple perspectives which should include socio, economic and environmental aspects. Not steered towards one right answer |

"Teach me, and I will forget, show me, and I will remember. Involve me, and I will learn." (Source unknown)

Implication for practice: Digital literacies & the environment

The future of the Earth's environment and its ecosystems are an increasingly urgent global concern. The complexity and diversity of the issues can only be properly address by involving and engaging all scale of possible actions from the individual to global organizations. As educators, among our many roles, one is to encourage schools to integrate a curriculum that will create informed, engaged and empowered citizens of the world.

The Wonder of Water seeks to address the various issues as well as the integration of best practices for Education for Sustainable Development via various digital mediums. It will use these mediums to connect students with information such as orientation, exploring, focusing and

locating (Markless & Streatfield, 2007). For instance, many links are posted on the blog and students are encouraged to use them as a starting point to explore and learn about water issues. They are also learning to use search engines such as *Google*. In addition, they are learning to interact with information, while thinking and evaluating it critically (Markless & Streatfield, 2007). On the blog, they have the opportunity to interact with a wide variety of experts in various fields such as education, international development and sustainability, and finance. They are exposed to images and multimodal texts from both these experts and their peers, which they are encouraged to question and comment. Students also make use of information by transforming it, (through bricolage of various formats), communicating it (on a posting on the blog, their web page, water scrapbook...) and applying it to their final project, which includes an art gallery of their photographs and other formats of ecological arts (Markless & Streatfield, 2007).

Matilsky (1992) in *Fragile Ecologies: Contemporary Artists' Interpretations and Solutions* maintains that artists have the ability to translate ideas into images that can profoundly influence public perceptions of local ecosystems by communicating the wonder of nature. For instance, Matilsky (1992) mentions the Minata (Japan) project where photographs were used to focus public attention on the issue of water pollution. In another project called the L.A. River Project, students' direct observation of the river and the coming to their own solutions to the problems through ecological arts, won public attention and improved the state of the river (Matilsky, 1992). These ecological artworks are examples of interdisciplinary environmental programs where artists of all age demonstrated how people can make a change to their local environment. Hence, *The Wonder of Water* emphasizes the creation of action projects centred on ecological art using digital mediums, such as photography. Moreover, Capello and Hollingsworth (2008) argue that:

Photography has the potential to enhance what is possible by amplifying what teachers are able to do... (and) by expending what students are able to produce as a result of their investigations. Photography has the potential to help change the ways in which students learn. (p.443)

Photography is a multimodal text, which offers students an alternative way to respond to text, moving beyond positivist notions of photography depicting literal truth and, as maintained by Capello and Hollingsworth (2008): "students need to have many ways of thinking and sharing available to them in order to engage more fully in pursuing questions within the classroom that are significant in their own lives" (p. 444).

In their report, Rivet and Schneider (2004) demonstrate that photography has the potential to support students' inquiry in real-world setting. Rivet and Schneider (2004) researched students' use of photography in their study about the health of a local stream and the creation of a website to share their knowledge with the community (Rivet & Schneider, 2004). They also observed how the use of pictures led the students to ask more questions about what was being investigated. In their research, they compared taking pictures of an ecosystem with the use of a telescope in astronomy; both can be used to capture large-scale phenomena and can collapse time with a series of images.

Rivet and Schneider (2004) also found that students used their photographs in order to learn and share information with others. Furthermore, the development of a website to share their knowledge offered an opportunity for the students to participate in the community and through this participation changed their ways of thinking and perceiving their local environment (Rivet & Schneider, 2004; Rogoff, 2003). The inclusion of photography and the creation of a website is

reported to have increased students' interest and awareness of the environment, as well as the amount of time students spent thinking about their ecosystem (Rivet & Schneider, 2004).

Hence, digital mediums, such as photography and the creation of a website or a blog, have the potential to transform students' thinking about the environment and to bring positive change in the community. The curriculum presented in this project will demonstrate how digital literacies and environmental change can come together to create an empowering learning experience for students that can enable them to make a change on their local ecosystems.

"Students will understand our fundamental connections to each other and to the world around us through our relationship to food, water, energy, air, and land, and our interaction with all living things" (Ontario Ministry of Education, 2007).

Conclusion

Many scholars such as Kress (1997), Harste, Woodward and Burke (1984), Kendrick, Jones, Mutonyi, and Norton (2006), Rogoff (2003), and Vygotsky (1978) demonstrated that the ways students are learning represent how multimodalities need to be included and valued in today's teaching methodologies. For the purpose of expanding my students' access to a wide variety of ways of meaning making and to refrain from limiting their possibilities, I created a multimodal curriculum based on digital mediums, such as digital photography and the creation of a blog. I selected these particular modes of meaning making with the hope that it would increase students' engagement with their local ecosystems by enabling them to see the world through their own lenses and to let their own voices shine.

The integration of Indigenous ways of knowing into this project also validates local knowledges and exposes the rest of the community to a certain kind of life kinship which has usually been unfamiliar. Hence, *The Wonder of Water* offers students a way of meaning making

which takes place through experiential learning that interconnects the students' lives with the community and their local ecosystems.

Photography, as a form of digital literacy, is an ideal medium that is well suited for environmental education. The New London Group (1996) advocates an Education in which the learning processes would "recruit rather than attempt to ignore and erase the different subjectivities, interests, intentions, commitments, and purposes that students bring to learning" (p.18). Photography accomplishes this by being a mode with which students can engage their own experience and discourse; offering students a place from which to speak with the power to be heard. It is the unique power of their voices that will create the strength of a multimodal curriculum for environmental change.

"We have an ocean flowing through our veins" (David Suzuki, 1997)

SECTION 3: MAKING CONNECTIONS THE WONDER OF WATER

Main Objective

To provoke students thinking about the importance and the state of water in their community and the world, and what it involves for the future. It is an invitation to teachers and students to explore the magic of water and its wonders on life on Earth. Students will improve a variety of literacy skills, such as writing, reading images, via various modes of meaning making, while at the same time gaining a sense of empowerment by engaging with the world through their own lenses. This program also integrates the principles for organizing and conceptualizing environmental education from the BC Ministry of Education *Environmental Learning and Experience: An Interdisciplinary Guide for Teachers.* As such, *The Wonder of Water* is a crosscurricular program which provides opportunities, inside and outside the classroom, for students to engage in actions that deepen their understanding of complexity, aesthetics, responsibility and ethics for the environment.

3

Rationale

 The Wonder of Water contains lessons and activities to help educators integrate the principles of Education for a Sustainable Development through water action projects in the classroom. The United Nations declared 2005-2014 the Decade of Education for Sustainable Development. Blue Planet aims to educate teachers on the meaning and importance of teaching for a sustainable future and ways in which they can positively engage students in sustainable action projects. Multimodal: encourages different modes of learning

Experiential: action project where students take actions in the community Spiritual: encourages the development of compassion and respect for all living and non-living things Value: encourages students to clarify and express their own values. Connection: encourages students to connect with the community and the Earth by going outdoor Multi-dimensional: must include the socio, economic and environmental dimensions of an issue Networking: provides opportunities for

cooperative learning

- It is an interdisciplinary program which uses photography and other technologies to engage students with the world and their writing. The program emphasizes the creation of a community where students have the opportunity to develop a sense of active citizenship with a mutual kind of learning centered on environmental change.
- The Wonder of Water adopted an expanded definition of literacy which will give your students the possibility to construct meaning using a variety of semiotic tools, such as visual images through the use of photography, a blog, the creation of a portfolio and an exhibit.

³ Adapted from:

Learning for a Sustainable Future. (2008). *Engaging students in sustainable action projects* (Workshop participant guide). Toronto: ON.

Why water?

A sustainable future cannot be imagined without taking actions in our daily lives to save our water. There is an increasing focus on quality water management and conservation in order to address the limitations of fresh water availability. At the individual level, each of us has the power to make a change in our water consumptions. The activities contained in Blue Planet will guide you through the different steps necessary to implement a water action project with your students.

Education for a Sustainable Development

One of *The Wonder of Water*'s goals is to integrate the best practices of Education for a Sustainable Development. Education for a Sustainable Development (ESD) encourages educators, among other principles, to bring students outdoor, to help them connect with Earth and with all living and non-living things using all of our senses.

THIS WATER CURRICULUM WAS DEVELOPED ON THE PREMISES THAT A SUSTAINABLE FUTURE:

| * | Recognizes that growth occurs within some limits |
|---|---|
| * | Values cultural diversity |
| * | Respects other life forms |
| * | Works toward some shared values amongst the members of the community |
| * | Makes decisions and plans in a manner that includes the perspectives from the social, health, economic and environmental sectors of the community |
| * | Makes best use of local efforts and resources |
| * | Use renewable sources of energy |
| * | Fosters activities which use materials in continuous cycles |
| * | Does not compromise the sustainability of future generations |
| * | Has a stable, dependable and diversified economic base |
| * | Provides a range of opportunities for rewarding work |
| * | Satisfies the basic needs of every one of its members including the opportunity to fill her or his potential |
| | |

⁴ Adapted from: Richardson, N. (1994). *Making our communities sustainable. The central issue is will.* Ontario Round Table on Environment and Economy in Readings on Sustainability. Toronto: ON. (21-22)

Instructional Procedures for Effective Education for Sustainable Development ⁵

| Characteristics | Explanation | |
|--|---|--|
| Aboriginal Perspectives | Allowing their holistic worldview could help transform society's consciousness in relation to the forces of Nature. Looking at how they learned in connection with Earth could help inform Education for a Sustainable Development which also strives to connect students with their environment. | |
| Interdisciplinary Learning | Learning integrates knowledge, process and skills from different subject areas (science, math, language arts, visual arts and others). | |
| Discovery/Inquiry Learning | Active and open-ended learning. Students address an issue/problem which requires the application of critical thinking skills. Students investigate and experiment with increasing independence. | |
| Strong Values Component | The learning experience provides students with specific opportunities to reflect upon and express their own values. Learning is structured so that multiple/complex perspectives are possible. | |
| Shared Responsibility for Learning | The learning design requires students to assume some responsibility for deciding what they will learn and how to apply the results of their learning for the benefit of the larger community. | |
| Locally Focused Learning | The program provides learning that is made concrete in some way and is relevant to the lives of the learners. The learning activities are locally relevant while also recognizing the global ramifications. | |
| Experiential Learning | Students learn by participating in authentic experiences that have real consequences. Learning takes place in the real world using real skills and tools to solve real problems. | |

WHY ACTION PROJECTS?

Learning through and from action projects engages teachers and students in a form of experiential education, which involves identifying a problem, researching an issue, envisioning solutions, and acting to effect change. Action experiences foster a sense of hope by

⁵ Adapted from: Learning for a Sustainable Future. (2008). *Engaging students in sustainable action projects* (Workshop participant guide). Toronto: ON.

encouraging students to develop practical skills and strategies for future problem-solving and active citizenship. Students experience first hand that they can make a difference.

Action projects:

| Offer authentic, relevant, meaningful opportunities for learning and for taking responsibility. | Create a natural relationship between the people in the school and the wider community. |
|---|--|
| Experiential; cater to different learning styles. | The outcomes can have substantial, positive, consequences for all of us. |
| Illuminate the trans-disciplinary and deeply interconnected nature of real problems. | Model active citizenship for students and the community and increase likelihood of engaging in future action projects. |
| If involve with being outdoor, it provides students with opportunities to fall in love with Earth. | Cultivate skills, knowledge, attitudes necessary for active citizenship. |
| Using the environment as an integrating context for learning has been linked to improved test scores on standard tests. | Can help students to learn how to think from a systems perspective and how to appreciate complexity. |



⁶ I created this graphic during my work with Learning for a Sustainable Future in January 09.

"Children of a culture born in a water-rich environment, we have never really learned how important water is to us. We understand it, but we do not respect it." William Ashworth, Nor Any Drop to Drink, 1982

Goals

- Teachers and students will explore the magic of water and its wonders on life on Earth.
- Students will be introduced to and researched water issues, the state of water in their community and the world, and what it involves for the future.
- Students will select an issue and make an inform decision on a solution to implement in their community based on an understanding of water issues, personal values, and the values of the members of their community.
- Students will become informed, engaged, and empowered citizens able to shape the future of our communities and our global environment in a way that does not compromise future generations.
- Students will improve their writing skills and their ability to read images via various
 modes of meaning making and technologies while at the same time gaining a sense of
 empowerment by engaging with the world through their own lenses.

Time Frame

Typically 2-3 hours per week for 12 weeks. Tentative schedule:

| Week # | Lesson # | THEMES |
|--------|-----------------|--------------------------------------|
| 1 | 1, 2 | INTRODUCTION TO LTP |
| 2-3 | 3, 4, 5 | INTRODUCTION TO WATER |
| 4-5 | 7, 8, 9, 10, 11 | IMPORTANCE OF WATER & PHOTOGRAPHY |
| 6-7 | 12, 13, 14 | LOCAL SOURCES OF WATER |
| 8-9 | 15, 16, 17 | SELECTING AN ISSUE & PROJECT |
| 10-11 | 18, 19, 20 | PROJECT PLANNING & ACTION |
| 12 | 21 | PRESENTATION OF PORTFOLIO |
| 12 | 22 | EXHIBIT |

Material

- Folders for all students
- Scrapbooks for all students
- Pictures (water advertisings, documentaries and snapshots)
- Digital Cameras
- Computer software to download, organize and print pictures
- Printer (preferably in color)
- 100% recycled paper to print pictures when necessary
- Internet access

Preparation

- Send a letter home to parents to ask permission for students to take pictures of themselves and to bring their digital camera to school when possible
- Create a blog for your students to post and comment on the issues, problems and solutions (see example at <u>www.thewonderofwater.blogspot.com</u>)
- ✓ Make a copy of the various pictures you will need (overheads could also be useful)
- ✓ Copy self-evaluation for group work and final project
- Create a poster of terms used in photography

Assessment

This curriculum contains ongoing formative assessment of student's ability to complete the assigned task in the lessons. The end of project summative assessment is carried out when students have completed all their activities, prepared their portfolio presentation for their peers and teacher, and participated in a community exhibit. The appendix contains examples of evaluation rubrics, a language convention checklist as well as a student self-evaluation form.⁷

Main assessment tools:

- Creation of a portfolio: each student will receive a folder and will be responsible to collect all received material as well as their work.
- Each student will be responsible to imagine and create an exciting format for the presentation of their work (poster board, scrap book, digital scrap book or other computer presentation, video...)

format should be discussed with the teacher

- Develop rubrics and checklists to capture your observations and allow students to assess their own learning.
- Participation in a community exhibit to be organized by the students and the teacher

At the beginning of the unit

- Introduce the unit with time for students to set up a system of note keeping and reflection. Portfolios, journals, notebooks either digital or hardcopy may be used, and introduce them to the classroom blog if you choose to set one up.
- Include the key learning questions of the unit at the beginning of the journals to help direct students' thinking.

During the unit

- Provide opportunities for students to write, reflect and organize their journal. Use the reflection questions suggested in the appendix to support students' thinking.
- Schedule time for student teacher conferences to review progress, provide feedback
 using evaluation criteria.
- Design methods of capturing your observations of student learning including use of rubrics (see appendix p. 69) or checklists or anecdotal records.

⁷ This assessment section is adapted from: Learning for a Sustainable Future. (2008). Engaging students in sustainable action projects (Workshop participant guide). Toronto: ON.

Key learning questions for the portfolio

Students will demonstrate in their portfolio their answer to the following questions:

- 1) Why is water important?
- 2) What are some concerns people in your community have about water?
- 3) What are some concerns people outside your community have about water?
- 4) What concerns do you have about water?
- 5) Do you want to make a change related to water issues?
- 6) How do you want to make a change?

At the end of the unit:

- Review learning goals and evaluation criteria and reflect with students on their progress.
- Use a variety of evidence of learning including group work products and presentations, anecdotal notes, student journals/portfolios, blog participation and action learning projects.
- Use data for feedback to students and for reporting.
- Collect samples of student work to use as examples for future years.

| | Level 1 | Level 2 | Level 3 | Level 4 | Self | Teacher |
|---|---|--|-------------------------------------|--|------|---------|
| Knowledge/ Understanding Demonstrate knowledge and understanding of water issues | Thorough knowledge and understanding | Considerable knowledge and understanding | Some knowledge and understanding | Limited knowledge and understanding | | |
| Thinking/ Inquiry Demonstrate the use of critical and creative thinking skills to make a change on a local issue related to water | Thorough knowledge and understanding | Considerable knowledge and understanding | Some knowledge and understanding | Limited knowledge and understanding | | |
| Application Demonstrate various steps to make a positive change in the community | Thorough knowledge and understanding | Considerable knowledge and understanding | Some knowledge and understanding | Limited knowledge and understanding | | |
| Communication Portfolio, journal, blog participation (spelling, grammar, clarity) | Thorough knowledge and understanding | Considerable knowledge and understanding | Some knowledge and understanding | Limited knowledge and understanding | | |

Sample of Assessment Rubric for Water Issues Action Project (in appendix p.69)

Also in appendix:

Blue Planet – Assessment Rubric for Mind Map (p. 70)

Blue Planet- Magical Water- Features and Conventions of Language (p. 71) Blue Planet- Student Performance Self-Evaluation Form (p. 72)

Additional assessment resources:

Davies, Anne (2000). Making Classroom Assessment Work. Courtenay BC. Connections Publishing,

Heacox, Diane (2002). Differentiating Instruction in the Regular Classroom: How to Reach and Teach all Learners, Grades 3-12. Minneapolis Minn: Free Spirit Publishing.

Barton, J., & Collins, A. (Eds.) (1997). Portfolio assessment: A handbook for educators. Menlo Park, CA: Addison-Wesley Publishing

CROSS-CURRICULAR INTEGRATION

⁸Key Concepts of Digital Literacies

| Basic Skills | Be able to open software, sort out and save information on the computer, and other simple skills in using the computer and software. |
|--------------|---|
| Download | Be able to download different information types from the internet |
| Search | Know about and how to get access to information |
| Navigate | Be able to orient oneself in digital networks such as a blog, learning strategies in using the internet |
| Classify | Be able to organize information |
| Integrate | Be able to promote and put together different types of information related to multimodal texts |
| Evaluate | Be able to judge the quality, relevance, objectivity and usefulness of the sources |
| Communicate | Be able to communicate information and express oneself through different mediational means |
| Cooperate | Be able to take part in net-based interactions and learning and take advantage of digital technology to cooperate and be part of different networks |
| Create | Be able to produce and create different forms of content: multimodal texts, photograph Be able to create something new by using available tools and software |

⁸ Developed by:

Erstad, O. (2008). Trajectory of remixing: Digital literacies, media production, and schooling. In C. Lankshear, M. Knobel (Eds), *Digital literacies: Concepts, policies and practices* (pp. 177-202). New York, NY: Peter Lang Publishing Inc.
Curriculum links to the grade 3 Prescribed Learning Outcomes of the British-Columbia Ministry of Education⁹

| SOCIAL STUDIES | |
|---|---|
| Skills and processes of social studies | |
| Creates a response to a relevant classroom, school or community problem or issue | See theme E (Selecting an issue and an action) & F (Project planning and action) |
| Applies critical thinking skills to selected problems or issues | See theme E (Selecting an issue and an action) & F (Project planning and action) |
| Gathers information from a variety of sources | See theme D (Local sources of water) |
| Governance | |
| Describe how an understanding of personal roles, rights, and responsibilities can affect the wellbeing of the school and community | Theme F (Project planning and action) |
| Human and physical environment | |
| Demonstrate a sense of responsibility for the local environment | Many opportunities throughout the entire program |
| FRENCH LANGUAGE ARTS | |
| Language and communication | |
| Expresses ideas in various forms (journals, scrap book, online) | Many opportunities throughout the entire program |
| Organizes information and ideas on a certain subject | See theme C (Importance of water and introduction to photography) and theme F |
| Asks questions to obtain information about a given subject | See theme C (Importance of water and introduction to photography) |
| Collects information and ideas from various sources for a specific purpose | See theme C (Importance of water and introduction to photography) and theme E&F |
| Prepares text for presentation | End of project evaluation |
| Demonstrate enhanced vocabulary knowledge and usage of terms used in photography | Many opportunities throughout the entire program |
| Use speaking, listening, and writing to respond, explain, and provide supporting evidence of student's connections between images and their interpretations | See theme B (Introduction to water), many other opportunities throughout the entire program |
| Use speaking and listening to interact with others for the purposes of contributing to group success by: | Many opportunities throughout the entire program |

⁹ Adapted from the adapted and compiled British-Columbia PLOs form of School District 36 (Surrey) updated on September 1, 2008.

| improving and contributing to comprehension generating questions sharing ideas staying on topic and ignoring distractions discussing and analyzing ideas and opinions | |
|---|--|
| Write a variety of clear, focused personal writing for a range of purposes and audiences that demonstrates connections to personal experiences, ideas, and opinions | Many opportunities on the blog, in their journal and scrap book |
| Create meaningful visual representations for a variety of purposes and audiences that communicate a personal response, information, and ideas relevant to the topic | See theme C, many other opportunities on the blog, in their journal and scrap book |
| Use the features and conventions of language (see appendix page XX for specific criteria) to express meaning in their writing | For the final presentation of their work |
| VISUAL ARTS | |
| Create images based on an issue in their community, using the elements and principles to produce a | See theme C, many other opportunities on |
| particular effect and using a variety of materials | final presentation of their work |
| particular effect and using a variety of materials Demonstrate a willingness to display individual and group artworks in a variety of ways | the blog, in their journal, scrap book and final presentation of their work See theme C, many other opportunities on the blog, in their journal, scrap book and final presentation of their work |
| particular effect and using a variety of materialsDemonstrate a willingness to display individual and group artworks in a variety of waysUse feelings, observation, memory and imagination as sources for images | the blog, in their journal, scrap book and final presentation of their work See theme C, many other opportunities on the blog, in their journal, scrap book and final presentation of their work Many opportunities throughout the program |

The Wonder of Water Action Process

- 1. Introduction to Literacy Through Photography
- 2. Introduction to water
- 3. Importance of water & photography
- 4. Local sources of water
- 5. Selecting an issue and an action
- 6. Project planning & action
- 7. Reflect, evaluate & celebrate

TEACHING PLAN

| Theme # | Торіс | Objectives/Learning Outcomes | | Materials |
|-----------------------------|---|---|--|--|
| A (Step 1) | Introduction to Literacy Through | Students will understand the objectives of Literacy Through Photography (LTP) and develop their visualisation skills. | *Folders for each copies of the prog letters for parents signed. *Recommended suggested reading | a student, gram & s to be sent home and books on water (see list of g) |
| Activities | Pnotograpny | | Assessment Students are resp their work in thei participation to the | onsible to keep a record of r portfolio. Online he blog. |
| 1 | Brainstorm the meaning containing the program appendix p. 47) | g of LTP with the class; each information and group discu | student receives a assion of the criteri | folder as a portfolio a for this program. (See |
| 2 | Explore the role of a ph now becoming the reco | notographer with the class. To orders of the world, real or im | ell the students that agined. (See lesson | as a photographer, they are n plan in appendix p.48) |
| Theme # | Topic | Objectives/Learning Outcomes | Materials | Assessment/Criteria |
| B (Step 2) Activities | Introduction to water | Students will developed a sense of aesthetic for water and explore water usage in their everyday life. | Recommended books on water (see list of suggested reading) | Students write freely about an image for 3-5 minutes and keep their writing sample in their portfolio. |

| Blog | It is a good time to org step by step guide that complicated. For an ex For more information Web in Your Classrood Oaks, CA: Corwin Pre TIPS: • Keep a class li • Book a time at how to log in a • You can post to students comm • Students shoul • On my blog I a find out more | ganize the classroom blog. Yo is very simple. <u>www.wordpre</u> cample see <u>www.thewonderof</u> see: Green, D., T., Brown, A. <i>m: A Teacher's Guide to Blog</i> ess. ist with students' usernames at t the computer lab to introduc and post a comment. the major themes of the lessor ment/reflect on them. Id also learn to post their imag added links to interesting sites information. | u can use <u>www.blo</u> <u>ess.com</u> offers mor <u>fwater.blogspot.com</u> , Robinson, L. (200 <i>s, Podcasts, Wikis,</i> and passwords e your students to t as on the blog with ges to share them w s link to water and | b <u>egger.com</u> and follow the e possibility but is more <u>n</u> 07). <i>Making the Most of the</i> <i>Pages, and Sites</i> . Thousand he blog and demonstrate the questions and have with others. students can surf these to |
|------------------------------|--|---|--|---|
| 3 | Show your students the discuss: - What does the - Can you smell - What do you h | e water images you have select water feels like? the water? hear? | cted from the list of | f suggested resources and |
| 4. 1 | Read a story of how w means to them. | rater is used around the world | and have students | write and draw what water |
| gumenenenenenenenenenen 5 | Ask students: "What k and physically." | ind of water are you like? De | scribe how you are | like this water emotionally |
| Theme # | Торіс | Objectives/Learning Outcomes | Materials | Assessment/Criteria |
| C (Step 3) Activities | Importance of water and photography | Students will understand why water is so important for our lives personally, regionally, and globally | Digital cameras, portfolio, scrapbook, list of suggested questions. | Students keep their work sample in their portfolio. |

| | Students write a list of As a group, create a list | Thow they use water from the rest of 20 ways water is used and | moment they wal l post it on your o | ke up until they get to school. classroom blog. |
|---------|--|---|--|--|
| 7 | With the aid of a group record the answers in t | p brainstorm, students will nov their scrapbook. See appendix | v reflect about wa p.50 for a list of | ater usage in their home and suggested questions. |
| 8 | With your students dis Facial expression- Con Background For help on how to te Ewald, W., & Lightfoo and writing to childre | scuss some basics of photograp mposition (main elements of th each basic elements of photog ot, A. (2001). <i>I wanna take me</i> <i>m</i> . Boston, MA: Beacon Press. | bhy such as: he photograph)- F g raphy see: a picture: Teach | raming & Angle- |
| 9 9 | Based on their notes fr their family interaction | rom the brainstorm sessions, st n with water. (See appendix p.5 | udents create a li 51 for creating a | st of possible photo shots of water shot list) |
| 10 | Students will take pict family. Students take t collage in their scrapbe Water usage: <u>http://www.ec.gc.ca/w</u> | ures of all the different ways whe pictures and post them on the ook. | vater is used in th he blog with thei tm#sustain | e everyday life of their r comment or they do a |
| Theme # | Topic | Objectives/Learning Outcomes | Materials | Assessment/Criteria |
| D | <section-header></section-header> | Students will explore and be able to identify the sources of water for our region. Students will be able to answer: who gets water; when; and how much? Students will understand the water issues of greatest concern to our region. | | Students keep their work sample in their portfolio and contribute to the class blog by posting/responding to comments and images. |
| 11 | What are the sources of groundwater sources in www.metrovancouver. your local watershed w | of water for our region? (See ap in the Greater Vancouver Area .org) Use photograph of the w where students will be able to ta | opendix on p.52 o and Metro Vanco ratersheds and arr ake pictures. | on watersheds and ouver: range a fieldtrip to one of |

| n sterier of the product of the | Detailed lesson plans | on the Greater Vancouver downloading o | Watersheds will have been seen as a second s | be posted and available for |
|---------------------------------|---|--|--|---|
| 12 | Who gets water? Wh It costs money to provi to get the water to whe Cost of water: http://www.ec.gc.ca/wa Everyone in our waters the environment. Over suitable to drink, bath o | en? And how much? de the fresh water that you u re it is needed? Post this que ater/fr/info/pubs/Intwfg/f_con shed affects the amount and c 1 billion people in the world or wash in. | se. How much doe estion on the blog. <u>htnt.htm</u> juality of fresh wat do not have prope | s it cost for the government er available to others and r access to water that is |
| 13 | Jigsaw. Place students issue they most cared a (Freshwater available) pollution) (Freshwate (Population growth & v See mindmap rubrics dmc.umn.edu/activities edmall.gsfc.nasa.gov/w www.uwstout.edu/soe/ | into teams and have them resubout. Water issues of greates (Water cycle) (Water & agreer inflow) (Global warming of water) at: s/mindmap.assessment.pdf yebquest/sysmaprub.htm profdev/inspirationrubric.htm | eearch and teach th at concern to our re iculture) (Privatiz & water) | eir peers about the water egion: (see appendix p.61) ation of water) (Water |
| Theme # | Topic | Objectives/Learning Outcomes | Materials | Assessment/Criteria |
| E (Step 5) | Action Research project (selecting an issue and an action) | Students will explore and be able to identify and select the action they wish to take while considering their own values. They will also develop and acquire research skills. | Chart paper; internet access; markers | Students record these activities with the help of photograph and post what they have done on the classroom blog or in their scrapbook. |
| Activities 14 | What would you conder By examining different what they personally co | one? (See lesson plan in appe t types of actions students car onsider appropriate and inapp | ndix p.54) n take, teachers and propriate. | d students can reflect on |

| 15 | <u>Value line activity and</u> Students write things t students to do an imag care". Choose the 8 mo one they are the most i | 18 issues you care about. hat bother them about water. I inary line where one extremity ost popular issues. Post them a interested in, somewhat interest | Draw ideas rando y is "I really care around the room a sted in, and least | mly from a bin and ask " and the other "I don't and ask students to go to the interested in. |
|-----------------------------|--|--|--|---|
| 16 | Classifying project ide | as (See appendix p.56) | | |
| 17 | Research analysis (See | e appendix p.63) | | |
| Theme# | Торіс | Objectives/Learning Outcomes | Materials | Assessment/Criteria |
| F (Step 6) Activities | Action Research project (Project planning and action) | Students will acquire skills to plan a project and to build skills to make a change. | | Students record these activities with the help of photograph and post what they have done on the classroom blog or in their scrapbook. |
| 18 | Project planning (see a | lannanananananananananananananananan ppendix p.64) | un an | an a |
| 19 19 | Skill building activities Resources: Kielburger, M.,Kielbur Learning. | s (writing letters, lobbying, tele rger, C. (2002) Take Action! A | ephone skills) Guide to Active | citizenship. Toronto: Gage |
| 20 | Do it! | | ananananananananananananan | e de |
| (Step 7) | Reflect, evaluate and co Share your experience Celebrate!!! Do not for | elebrate.(see assessment tools on the blog and during the exh get to celebrate all the small so | appendix p.71-74 hibit uccesses along th | e an |

This teaching plan was inspired by:

Ewald, W., Lightfoot, A. (2001). I Wanna Take Me a Picture: Teaching Photography and Writing to Children. Beacon Press: Boston.

Learning for a Sustainable Future. (2008). Engaging students in sustainable action projects (Workshop participant guide). Toronto: ON.

Proctor, T., Klay, K. (2003-2004). Literacy through photography: Just a drop- water curriculum. Fotofest, TX: Houston.

"Never doubt that a small group of thoughtful committed citizens can change the world: indeed it's the only thing that ever has" (Margaret Mead).

SECTION 4: CONCLUSION

In the first chapter, I asked the following question: how can a multimodal curriculum be adapted to integrate learning for environmental change in the classroom? To answer this question I explored, in the second chapter, what the literature reveals about New Literacies, digital literacies, language and identity and Indigenous knowledge. The third chapter demonstrated how the work in this field can come together to create a powerful interdisciplinary curriculum centred on environmental change.

The work in New Literacies discussed the re-articulation of literacy to multiliteracy, a concept which calls for the development of students' ability to encode and decode meaning in all forms embedded in society (Eisner, 1991; Kress 1997; New London Group, 1996; Van Leeuwen & Jewitt, 2001). Hence, the multimodal curriculum, *The Wonder of Water*, presented in the third chapter, adopted an expanded view of literacy where meaning is created using a multiplicity of dynamic mediums.

The work in language and identity revealed that the use of photography in the classroom can not only offer students the opportunity to gain the right to speech and the power to impose reception (Norton, 2000), but it can also diminish the unequal power distribution between adults and children (Schratz-Hadwich et al., 2004). Hence, one of the goals of *The Wonder of Water* is to let the children speak for themselves; to let them become active observers of the world through their own lenses and to allow writing to flow from their own voices. *The Wonder of Water of Water* also brings the outside world inside the classroom by allowing students to build on prior learning and to engage their social identities outside the classroom (Early, 2008).

Furthermore, the literature supports that digital mediums can be best suited for environmental education. For instance, the inclusion of photography and the creation of a website are reported to have increased students' interest and awareness of the environment as well as the amount of time students spent thinking about their ecosystem (Rivet & Schneider, 2004). A main element of *The Wonder of Water* is also the creation on an ecological art project, using digital mediums. Through their arts students hope to translate ideas into images that will communicate the wonder of water and influence public perceptions of the Earth's ecosystems (Matilsky, 1992).

The Wonder of Water is an interdisciplinary curriculum which demonstrates how the work in New Literacies, digital literacies, language and identity, and Indigenous knowledge can come together to create an empowering learning experience for students, which can enable them to make a change in the world.

Spreading the word & future plans

This graduating paper, including the water curriculum *The Wonder of Water*, will be made available in French and English on a website that is currently under construction. Teachers will be able to download the curriculum, as well as all the appendices, which include lesson plans, students' worksheets, assessment rubrics, and additional resources. The material will also be available in a CD-Rom format. In addition, a link to my classroom blog will be created on the website in order for teachers to see an example of an environmental blog used in a classroom setting. Meanwhile, educators can download *The Wonder of Water*, in French and English on my class blog at www.thewonderofwater.blogspot.com. *The Wonder of Water* has been submitted to the organization of Learning for a Sustainable Future in order to make it available live on their online *Resources for Rethinking* database, which can be found at <u>www.resources4rethinking.ca</u>.

40

Negotiations are also taking place with the Blue Planet Run Foundation to include the curriculum on their *Teaching Corner's and Education Action Kit*.

Globally, *The Wonder of Water* was created with the view that a collaboration between a BC elementary school and a school in a developing country, on a common sustainable development project using digital literacies, would be established. To achieve this, my students will raise funds to finance a similar digital project in a developing country that is currently under negotiation. They will do this by organizing a local art gallery, which will take place in a community centre, and they will send an open invitation through our classroom blog, Facebook and emails. Their work will be sold through an auction that will take place during the exhibit. By raising funds to support a digital program in a developing country, the students hope to help the youth sell their work on a global market, via the internet, and to enable this community to not only be able to finance a clean water project but also to gain the necessary competence to take advantage of the opportunities offered by digital mediums. As such, *The Wonder of Water* is currently under review for the Canadian Ecohealth Training and Awards Program, in order to help further finance its local and global implementation. The details and processes of this ongoing project will be available live on the blog.

Finally, the students and community members who are part of this program are a small group of citizens who, by educating the people, will create a spiral effect and contribute to changing society's consciousness on water usage and the importance of fresh available water for the sustainability of humanity. By making this project available online in French and English it will promote a wider global cooperation that could improve the state of our worlds' water. I look forward to other people of the world to contribute to this project with their knowledge of the Earth's ecosystems, especially in regard to water.

41

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INTRODUCTION TO LTP

Time Frame: 45 minutes

Preparation

- Folders for each student
- Copy of the program for each student
- Letter for parents to be sent home and signed

Objectives

Students will understand the objectives of Literacy Through Photography (LTP) and develop their visualisation skills.

Introduction

- 1. In teams, students discuss what they think LTP means.
- 2. Brainstorm of the meaning with the class and teacher explains what LTP means. Literacy Through Photography means that students writing will be inspired through their own lens using photography.

Activity

- 3. Each student receives a folder containing the program information and reads it with a partner. Together they highlight questions they have.
- 4. Come to a group and answer the questions as you read the program as a whole class.

Closure

5. Students will receive a letter to bring home and to be signed by parents.

Assessment

Students are to keep their work in their folder.

THINKING LIKE A PHOTOGRAPHER

Time Frame: 45 minutes

Preparation

Select a book on water suited for a visualisation activity

Objectives

> Students will develop their visualisation skills

Introduction

- 1. Brainstorm with your students what they think the role of a photographer is.
- 2. Tell the students that as a photographer, they are now becoming the recorders of the world, real or imagined.

Activity

3. Divide the book you have selected into appropriate sections (2 for easy level, 4 for medium level, 6 for hard level) and cover the front page so the artwork can't be seen. Read the first section and send the students off to pretend they are photographers and encourage them to draw photographically as if they had been there and seen the events unfold. Give them a time limit (5-10 minutes) and repeat depending on the number of sections in which you have divided the story.

Closure

- 4. Share the pictures with the class.
- 5. Using a digital camera, have your students act out scenes they chose. Print the pictures out and they have their own picture book.

Assessment

Students are to keep their work in their folder.

| | THINKING LIKE A PHOTOGRAPHER | | | | | |
|-------|------------------------------|--|--|--|--|--|
| Name: | Date: | | | | | |

BRAINSTORM ON FAMILY AND WATER

How much water does your family use? How, when, and where do they use water?

What time of day does your family use the most water? Think of three ways your family uses too much water.

Which family members would you like to photograph together with water? Where?

What kinds of things float in water? What does it feel like to float in water? Where do you float in water?

What are the things your entire family does together that involve water?

Where do you put yourself in a picture with water?

Who else is part of your family that uses water? Your grandparents? A close friend or neighbour? An aunt or uncle? The dog or cat? How, where, and when do they use water?

Who do you depend on to provide water in your home and to take you to water? How would you show that in a photograph?

Does water make you mad? Does water make you smile> Why or why not?

Do you have family traditions or stories that make your family unique that involve water?

What do you wish your family could do or learn to do in or on the water?

Did you or one of your relatives travel over water to live in Canada? Who? How far? What body of water was travelled over?

Just a Drop Water Curriculum

CREATING A WATER SHOT LIST

Where will you take the picture?

What will be the source of water in the picture?

What do you want to show the viewer about water?

Who will be sitting, standing, touching, in, near, or interacting with the water?

Will the water be clean, dirty, soapy, fresh, etc.?

Will they be inside or outside?

Will there be animals, plants or people in the photograph?

What is the background?

What do you want the viewer to think of when they see the photograph?

Just a Drop Water Curriculum



Vancouver draws its drinking water from reservoirs in the Capilano, Seymour, and Coquitlam watersheds. Pipelines distribute these waters throughout the Vancouver area. Landslides in the watersheds are natural phenomena that usually occur during heavy rains, exposing soil to erosion. This allows mud to wash into reservoirs where it enters the water system. While cloudy water is not itself a health risk, silt and clay can reduce the ability of chlorine to kill bacteria and other microorganisms. Natural phenomena, such as wildfires, or poor forestry practices can also increase the incidence of landslides within B.C.'s mountainous areas.¹

Retrieved from http://geoscape.nrcan.gc.ca/vancouver/watershed_e.php



Groundwater is a hidden, often forgotten resource, yet it meets about half of the total water needs of areas not served by the North Shore reservoirs. Groundwater is supplied from over 10 000 wells in the Fraser Valley. Most of these are small household wells, but some high-yield wells support large communities and industries. Groundwater quality in many areas has been degraded by fertilizers, pesticides, septic field effluent, farm animal waste, and industrial chemicals. This carelessness results, perhaps, from the attitude "out of sight, out of mind".

Groundwater in the Vancouver area occurs in two main types of materials - modern and Ice Age sands and gravels, and fractured bedrock. The water is stored in pores between grains in sediments and in fractures in bedrock.²

² Retrieved from http://geoscape.nrcan.gc.ca/vancouver/water_e.php

WHAT WOULD YOU CONDONE

Time frame: 30-60 minutes

Material

- White board
- Markers
- A copy of the chart on the following page

Objectives

By examining different types of actions students can take, teachers and students can reflect on what they personally consider appropriate and inappropriate.

Introduction

• On the board, create a Venn diagram using two large, overlapping circles. In one large circle, write "would not condone" and in the other, write "would condone". The overlapping section in the centre of the diagram is for the actions you are not certain about.

Activity

- Read each student action listed below. Discuss the student action and decide if you would condone the student action described taking place in/ from your school.
- Write the number of the activity in the corresponding area of the Venn Diagram.

Closure

After you have placed all of the action numbers in the appropriate places on the diagram, look at the overall pattern on your diagram. Discuss the results (for example: What types of action are supported? Are they effective in making a change? What types of action are not supported? Is there a pair of activities in which the action is quite similar but the topic is different, resulting in one action being condoned and the other not?).

Assessment

Students are to keep their work in their folder.

Adapted from: Learning for a Sustainable Future. (2008). *Engaging Students in Sustainable Action Projects*. Toronto, ON: Learning for a Sustainable Future.

| | STUDENT ACTION |
|----|---|
| 1 | Students follow a local election in all its stages, interviewing voters in their community and attending local election meetings to raise awareness about the impact low-paying jobs have on working families. |
| 2 | Students host a press conference to alert the community about a by-law that is about to be passed that would make it easier to convert farmland to commercial property. |
| 3 | After learning that a new, heavy-polluting industry is hoping to come to their community, students create a campaign to urge fellow students to write letters to government to prevent the company from setting up shop in their community. |
| 4 | Frustrated that the car traffic outside of the school is polluting the air, students create a campaign to educate motorists about the negative effects of idling their cars. |
| 5 | Students choose a heavily-packaged toy and write to the company to tell the company executives that they will not buy the toy until the packaging is minimized. The students actively encourage other people to boycott the toys through a letter to the editor and posters at school. |
| 6 | Students organize a fundraiser to raise money for an organization that promotes fairly-traded products. |
| 7 | Students engage in a letter-writing campaign to local newspaper and radio stations to ask them not to advertise a new film which the students deem to be too violent. |
| 8 | Students create and mount a play that illustrates how the low wages paid to workers in a South American country indirectly accelerate the destruction of the rainforest. A branch of the multinational company in question employs many of the students' parents. |
| 9 | Students host a press conference to raise awareness about the work they are doing to combat racism in their community. |
| 10 | Students create a brochure and distribute it in the community to alert local residents about the impact household chemicals can have on the local creek. |
| 11 | After learning that a local company sells goods created in sweatshops in poor countries, students mount a sit-down protest at the school gates to stop an exhibitor from the company from participating in the school career fair. |
| 12 | Students create a survey to find out what teachers would need to have an "outdoor classroom" in order to use it well. Students then lobby the school board and the parent council to provide funds to build the outdoor classroom. Students even suggest that money should be taken out of other budgets like the library and the phys.ed budget to ensure that the outdoor classroom is built. |
| 13 | After learning about the health risk associated with pesticides, students write an open letter to the school board and have it published in a local paper, asking that pesticides no longer be used on their schoolyard. |

From: Learning for a Sustainable Future. (2008). *Engaging Students in Sustainable Action Projects.* Toronto, ON: Learning for a Sustainable Future.

TYPES OF ACTION PROJECTS³

Educate & Inform

This can involve educating peers or younger students about water issues in your area, community education programs, newspaper articles, plays, poems, posters, advertisements, workshops etc.

Make Consumer Choices

Personal decisions like refusing to buy items with more than one layer of packaging, buying toilets with smaller tanks, buying Canadian made and locally grown products, buying organic, boycotting products produced by known operators of sweatshops, buying used, reducing consumption etc.

Make Lifestyle Choices

This category includes such decisions that are not related to making purchases (those decisions are called 'consumer choices'). These choices may include:

- using low water flow showerheads
- reducing the amount of water used to flush your toilet by placing a brick in your current tank
- turning the tap off when brushing your teeth
- generally conducting one's life in ways which have less impact on the planet and are more sustainable in the long term.

Persuade Others To...

Similar to educate and inform, this approach attempts to convince people to make changes. Letters to the editor, PA announcements, advertisements (or anti-ads – see Adbusters' website), pamphlets, street theatre etc. are all useful persuasion tools).

Raise Funds

This can refer either to fundraising for an external cause or raising funds to implement your own project.

³ Learning for a Sustainable Future. (2008). *Engaging students in sustainable action projects* (Workshop participant guide). Toronto: ON.

Engage in Political Action

This can include meeting with elected officials, speaking at public meetings and hearings, circulating petitions, supporting political candidates, writing letters to the editor etc. Often, this type of action is geared toward achieving changes in legislation.

Eco-management Projects

These projects make physical changes to the environment including schoolyard naturalization, tree planting, river bank stabilization etc. They may also include other types of 'get-your-hands-dirty' type projects like installing water-saving tap aerators.

Civil Disobedience and Peaceful Dissent

Civil disobedience involves the active refusal to obey certain <u>laws</u>, demands and commands of a <u>government</u> or of an occupying <u>power</u> **without resorting to physical violence**. Examples:

- Rosa Parks sitting in the "white" section of the bus
- Draft dodgers—people who avoid serving military service
- "Tresspassers" who "sit in" an office without permission to attract attention to an issue

Peaceful Dissent is similar in that it involves opposition to a rule or to the usual way of doing things, but it does not involve breaking the law. Examples of peaceful dissent include: parades with protest signs, gatherings in public places (with a permit), wearing gym clothing inside out to protest the use of sweatshop labour, etc.

EXAMPLES OF ACTION PROJECTS—FOCUS ON WATER

- 1. Students were concerned when they learned that 2/3 of the world's population will not have access to clean water as of 2025. Students created a compelling audio/visual presentation to play over-and-over again in the foyer of the school during events in which the community was already invited to the school (eg. parent-teacher interviews, holiday concert, etc.). In addition, students identified several non-profit organizations that work to help people throughout the world gain access to clean water. The students printed information from the non-profit organizations to have available for members of the public to take home if they wanted to learn more after seeing/hearing the students' presentation.
- 2. Several families at this local school were dealing with low water levels in their household wells. Students began to ask questions about where the local beverage company was getting the water to make the bottled beverages. Students explored these questions with the local municipal government and conservation authority. Then the students wrote an article about what they learned and their concerns. They searched for diverse venues in which to share the article, including: the local newspaper, the school website, the community bulletin board at the library, etc.
- 3. Students learned that 75% of India's surface water and 80% of China's surface water has become too contaminated to drink. The students decided to find out what chemicals in their own homes were contaminating their local bodies of water. When students learned that many cleaning products were the culprits, they decided to lead a campaign in their own homes to reduce the use of commercial cleaning products. The students promised that for three weeks, they would offer to clean anything appropriate with baking soda and vinegar instead of the cleaning product their family usually used. At the end of the campaign, students shared stories about which tasks could continue to be done using baking soda and vinegar and which tasks their families were opting to switch back to the commercial cleaner.

- 4. When researching water issues on the internet, students learned about peoples' concerns in India related to a particular pop company's practices at their bottling plants in India (for example, the pop company is accused of using up ground water supplies in drought-stricken areas, making beverages from water that has high levels of pesticides in it, producing hazardous waste and not disposing of it properly, etc.). Students decided that they wanted to find out which products in their local stores were sold by the particular pop company they were studying. Then, the students made individual personal pledges to reduce or eliminate their own consumption of the pop products for a two week period. Many of the students decided to continue their personal avoidance of the specific pop products indefinitely.
- 5. At a local conference, some students learned about a nonprofit organization that supports park and 'turf' managers to manage lawns and gardens without the use of pesticides (organiclandscape.org). The students were concerned when they learned about the persistence of pesticide chemicals in the water system. The students decided to contact the parks manager for their municipality and the greens keepers for two local golf courses. They prepared a list of questions to ask the managers via email concerning their use of pesticides. Once the students ascertained that pesticides were indeed being used, they requested a meeting at which they tried to persuade the managers to seek the support of the nonprofit organic greens- keeping organization. When one of the managers agreed to do this, the students wrote a letter to the editor of the local newspaper thanking the manager for her openness and forward-thinking approach (and reporting the lack of action by the other two managers).
- 6. A group of students designed an audit that they used to analyse the litter found in a local river. They identified the types of litter they found most frequently and the probable sources of the litter. The students then did research to pinpoint some of the potential negative consequences of having the most populous types of litter in the river. Once equipped with compelling and specific information about the litter, the students wrote letters to the businesses that were originally responsible for the litter to ask them to consider alternative types of packaging for their products (eg. biodegradable packaging, reusable containers, etc.). The students learned how to identify the person at the companies that would be most likely to constructively respond to their requests. They also experimented

with contacting more than one department at a particular company to see what types of responses they would get from the different employees.

- 7. One student watched a television program in which she learned that poor sanitation systems can lead to outbreaks of waterborne diseases such as cholera. She was particularly concerned about the cholera epidemic in Zimbabwe. The student shared this information with her classmates; the classmates felt compelled to act. In small groups, the students researched different organizations that help financially poor communities to build safe sanitation systems to protect the quality of the drinking water. The teacher helped the students to generate a list of criteria to use to decide upon an organization to which they should donate funds. After choosing an organization to support, the students then researched different types of fundraising opportunities. They chose to sell compact fluorescent light bulbs to raise funds for the water charity through http://greenstudents.ca/.
- 8. A guest speaker visited a grade eight class and told them about a number of countries in the world where the countries are being forced to sell household tap water distribution system to private companies (the International Monetary Fund often stipulates that certain public services must be privatized in order for the country to qualify for financial loans). Students were angered by the difficult and often tragic position in which this puts financially poor families in cities like La Paz, Bolivia. The students were also moved to try to protect their own municipal water supply. In an effort to try to get members of their community to better appreciate tap water and to reduce the waste associated with plastic water bottles, the students sold stainless steel water bottles (http://greenstudents.ca/.) at school sporting events and gave away free fill-ups of tap water to people who bought the water bottles. The profits that they made were donated to a nonprofit organization that promotes the protection of public rights to water (http://www.canadians.org/).

Facts from speech by Maude Barlow, Senior Advisor on Water Issues to the President of the General Assembly of the United Nations <u>http://video.google.ca/videoplay?docid=-2452563840429862970</u> viewed January 3rd, 2009.

RESEARCH ACTIVITIES

Time Frame: 60 minutes & 4-8 days to research

Preparation

Chart paper separated in four sections with a square at the centre to write the water issue being researched. In each section write the following questions:

- 1) What is the water issue that bothers you? Write details and examples.
- 2) Who is involved in this problem? Name as many people/ organizations as possible.
- 3) How could this situation be different? What are other options that would be better for the environment?
- 4) What else do you want to know about this water issue?

Objectives

In groups of 4, students write as much as they know about their issue as well as their own questions about the issue on the chart paper. The questions are then numbered and students decide on the best way to find the answers before conducting the research.

Introduction

6. Write the questions or the board so that you can model the answers and ask for suggestions to check for student understanding before they work in their small group.

Activity

- 7. At the same time each student writes one answer to the question that is on front of them on the chart paper. When they are ready they move around so that they are facing a new question. Each student should have a chance to read, add to and contribute to all of the questions.
- 8. With the whole class, the teacher reviews the answers and creates a list of "what else do you want to know".

Closure

9. Students select 1-2 questions and are provided with a list of possible sources of information. As they gather information, they write notes on the page with the associated question and note where they found the information.

Assessment

Students are to keep their work in their folder.

*

Adapted from: Learning for a Sustainable Future. (2008). *Engaging Students in Sustainable Action Projects*. Toronto, ON: Learning for a Sustainable Future.



RESEARCH ANALYSIS

Time Frame: 60 minutes

Preparation

Your own mind map to share with the students or build one together about a concept they already know well.

Objectives

To build a model mind map representing what they have learned from their research.

Introduction

10. Students draw a circle in the middle of a page. Students write in words/pictures/drawing to describe their issue.

Activity

- 11. Students write/draw/picture around the circle the various things they have learned about the issue.
- 12. In pair, students explain their mind map to each other and listen to suggestions from their partner.

| Closure | | |
|---------|--|--|
| | | |

13. Students revise their mind map based on the feedback they received from their partners.

Assessment

See mind map rubric

Adapted from: Learning for a Sustainable Future. (2008). *Engaging Students in Sustainable Action Projects*. Toronto, ON: Learning for a Sustainable Future.

Name:

Date:

| Responsibility | | | |
|----------------|--|--|--|
| Team members | | | |

1. Name the water issue you are working on:

2. Why do you care about this issue?

3. Color the type of action you will take to deal with this water issue and describe the action you will take to make it better.

| Type of action | Describe the action you will take |
|---|-----------------------------------|
| Educate & Inform the community members | |
| Convince people to make a change | |
| Fundraising | |
| Get involve in political actions | |
| Make personal lifestyle choices | |
| Make better consumer choices when buying things | |
| Get your hands dirty projects | |

4. Why did you choose this particular action?

5. What is the goal of your project?

6. Who is the target audience for your project?

7. List everyone affected by this water issue and the people likely to oppose/have concerns about the project.

| Who could provide support? | |
|-------------------------------------|--|
| Who may be oppose/concern? | |
| Who/what is affected by this issue? | |

8. Evidence that you have made progress towards our goal.

| Evidence of progress | Tools to measure success | What would we be happy with? | Status on: date | Status on: date |
|----------------------|-----------------------------|---------------------------------|--------------------|--------------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

67
| Project Planning 5 would do differently | v did your project make a difference? | |
|--|---|------|
| i (complete in small groups or with the class) in List what you | made a difference? If applicable hov | - 89 |
| End of project evaluation List what you would do agai | Do you believe that your project Explain why or why not. | |

Assessment Rubric for Water Issues Action Project

Date:

Name:

| | Level 1 | Level 2 | Level 3 | Level 4 | Self Assmt | Teacher Assmt |
|--------------------------|--|---------------|---------------|---------------|--|---------------|
| Knowledge/ | Thorough | Considerable | Some | Limited | | |
| Understanding | knowledge and | knowledge and | knowledge and | knowledge and | | |
| | understanding | understanding | understanding | understanding | | |
| Demonstrate | | | | | | |
| knowledge and | | | | | | |
| understanding of water | | | | | | |
| issues | | | | | | |
| Thinking/ Inquiry | Thorough | Considerable | Some | Limited | | |
| | knowledge and | knowledge and | knowledge and | knowledge and | | |
| Demonstrate the use of | understanding | understanding | understanding | understanding | | |
| critical and creative | | | | | | |
| thinking skills to make | | | | | | |
| a change on a local | | | | | | |
| issue related to water | | | | | | |
| Application | Thorough | Considerable | Some | Limited | | |
| | knowledge and | knowledge and | knowledge and | knowledge and | | |
| Demonstrate various | understanding | understanding | understanding | understanding | | |
| steps to make a | | | | | | |
| positive change in the | | | | | | |
| community | | | | | 1. 4. A. | |
| Communication | Thorough | Considerable | Some | Limited | | |
| | knowledge and | knowledge and | knowledge and | knowledge and | | |
| Portfolio, journal, blog | understanding | understanding | understanding | understanding | | |
| participation (spelling, | 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1 | | | | | |
| grammar, clarity) | | | | | | |

69

Assessment Rubric for Mind Map

Name: _

| | l aval 1 | l aval 2 | Level 3 | | Cold Assent | Tambar Anni |
|------------------------|---------------|---------------|---------------|---------------|-------------|---------------|
| (nowledge) | Discussion | | | Level 4 | Sell Assim | ledcher Assmi |
| vilowiedge/ | ulagram | ulagram | Diagram | Diagram | | |
| Understanding | shows an | shows good | shows some | shows limited | | |
| | excellent | understandin | understandin | understandin | | |
| Reflect understanding | understandin | g of the | g of the | g of the | | |
| of multiple dimensions | g of many | many | many | many | | |
| of the issue | consequenc | consequenc | consequenc | consequenc | | |
| (economic, politic, | es of the | es of the | es of the | es of the | | |
| environmental) | issue | issue | issue | issue | | |
| | | | | | | |
| Thinking/ Inquiry | Diagram | Diagram | Diagram | Diagram | | |
| | shows an | shows good | shows some | shows limited | | |
| Demonstrate an | excellent | understandin | understandin | understandin | | |
| understanding of how | understandin | g of | g of | g of | | |
| the multiple | g of | relationships | relationships | relationships | | |
| dimensions are | relationships | | | | | |
| interconnected | | | | | | |
| | | | | | | |
| Communication | Information | Information | Information | Information | | |
| | is | is | is | is | | |
| • Language | communicat | communicat | communicat | communicat | | |
| | ed with | eq | ed | ed with | | |
| to convev | excellent | effectively | somewhat | limited | | |
| information | effectiveness | | effectively | effectiveness | | |
| | | | | | | |

FEATURES & CONVENTION OF LANGUAGE

The student written work has:

- A central idea or theme
- Well organized and developed ideas (fluency, details,

explanations...)

- A personal and engaging/expressive voice
- The development of ideas by making connections to personal feelings, experiences, opinions, and information
- Effective word choice (precise nouns, powerful verbs and adjectives)
- Write simple sentences using appropriate punctuation such as capital letters and periods
- Accuracy in spelling
- Identifies and corrects frequent Anglicism
- Legible writing appropriate to context and purpose

Student Performance Self-Evaluation Form

Name: _____

Date:

| | Seldom | Sometimes | Often |
|--|--------|-----------|-------|
| I contributed ideas to the classroom discussion | | | |
| I contributed ideas in our small group discussion | | | |
| I listened and respected the ideas of others | | | |
| I helped make decisions and solve problems | | | |
| I took risk by exploring things that are new to me | | | |

1) What is the most interesting thing about what I did today?

2) What was positive?

3) What was negative?

4) What I have learned?

5) Questions I have:

The second second

ADDITIONAL RESOURCES

Websites

Alberta Council for Environmental Education: <u>www.abcee.org/</u>

Alberta Education: www.education.gov.ab.ca/

Amnesty International Activist Toolkit: http://www.amnestyusa.org/activist_toolkit/index.html

Australia Educating for a Sustainable Future: <u>www.environment.gov.au/education/publications/sustainable-future.html</u>

Australia National Environmental Education Network: <u>www.environment.gov.au/education/neen/</u>

Australia Sustainability Education: www.environment.gov.au/education/

British-Columbia Ministry of Education: <u>www.gov.bc.ca/bvprd/bc/channel.do?action=ministry&channellD=8382&navld</u> <u>=NAV ID province</u> California Education and the Environment Initiative: <u>www.environment.gov.au/education/neen/</u>

California Environmental Education Interagency Network (CEEIN): www.calepa.ca.gov/education/CEEIN/

California Regional Environmental Education Community: <u>www.creec.org/</u>

California School Waste Management Education and Assistance: www.ciwmb.ca.gov/schools/

Caring for Young People's Rights Editor: Roland Case Taking it Global Action Guide: <u>http://www.takingitglobal.org/action/guide/Guide_to_Action.pdf</u>

Finland's Ministry of Education: A national strategy and guidelines 2006-2014 for education for sustainable development: <u>www.bup.fi/Finnish_Min_of_Educ_strategy_for_sust_dev.pdf</u>

Freechild Project: http://www.freechild.org/

Ireland Department of Education and Science:

www.education.ie/home/home.jsp?pcategory=27173&ecategry=27173&langua ge=EN

Israel Ministry of Education:

http://cms.education.gov.il/educationcms/units/owl/english/about/ministry+stru cture.htm

Making a Commitment Matter Toolkit UN: http://www.un.org/esa/socdev/unyin/documents/toolkit.pdf

Me to We Teacher Resources: <u>http://metowe.org/the-book/educator-</u> resources.html

Millennium Campaign: http://www.millenniumcampaign.org

Minnesota A GreenPrint for Minnesota: www.seek.state.mn.us/eemn_d.cfm

Minnesota Capacity Building for EE in Minnesota: An Overview: <u>www.seek.state.mn.us/eemn_f.cfm</u>

Minnesota Environmental Education Advisory Board: www.seek.state.mn.us/eemn_i.cfm

Minnesota Environmental Literacy Scope and Sequence: www.seek.state.mn.us/eemn_c.cfm

Minnesota Office of Environmental Assistance: www.pca.state.mn.us/oea/about/index.cfm

Minnesota SEEK: Minnesota's interactive directory of EE resources: <u>www.seek.state.mn.us/</u>

Minnesota The Second Minnesota Report Card on Environmental Literacy: www.seek.state.mn.us/eemn_b.cfm

New Zealand Environmental Education in the Schools: www.minedu.govt.nz/web/downloadable/dl3525_v1/sci-nzc.pdf

New Zealand Parliamentary Commission on the Environment <u>www.pce.govt.nz/</u>

New Zealand: See Change: Learning and education for sustainability: <u>www.pce.govt.nz/reports/allreports/1 877274 56 9.shtmlEnvironmental</u> <u>Education</u> and <u>www.tki.org.nz/r/environ ed/</u>

Passons a l'action pour l'environnement: L'Eau http://www.ec.gc.ca/water/fr/info/pubs/FS/f FSA6.htm

Peace Child: http://www.peacechild.org/

Poverty toolkit:

http://www.planusa.org/stuff/contentmgr/files/9776c545adaa1bed1f0296664582 9755/miscdocs/poverty_toolkit_final.pdf

Quebec Ministry of Education, Recreation and Sports: www.mels.gouv.qc.ca/GR-PUB/m_englis.htm

State Education and Environment Roundtable The EIC Model - Using the environment as an integrating Context for improved student learning: <u>www.seer.org/pages/eic.html</u>

Sweden Ministry of Education and Research: www.sweden.gov.se/sb/d/2063

UK Every Child Matters: www.everychildmatters.gov.uk

UK Learning Outside the Classroom Manifesto: <u>www.teachernet.gov.uk/teachingandlearning/resourcematerials/outsideclassro</u> <u>om/</u>

UK Sustainable Schools National Framework: www.teachernet.gov.uk/sustainableschools/framework/framework_detail.cfm

UK Sustainable Schools <u>www.teachernet.gov.uk/sustainableschools/Growing Schools</u> and <u>www.teachernet.gov.uk/growingschools/</u>

World Youth Congress Toolkit: http://www.scotland2005.com/wyc/files/Actiontoolkit.pdf

Youth United for Global Action: <u>http://www.planusa.org/contentmgr/showdetails.php/id/2166</u>

Suggested readings

Beneath Their Blue, Blue Skins, (nv) <u>Spaceships & Spells</u>, ed. Jane Yolen, Martin H. Greenberg & Charles G. Waugh, Harper & Row 1987

Kielburger, M., Kielburger, C. (2002) Take Action! A Guide to Active Citizenship. Toronto: Gage Learning.

Active Citizenship: Student Action Projects Roland Case, Cliff Falk, Neil Smith and Walt Werner