Learning in the Outdoor Classroom: Integrating Nature, Mobile Technology, and Constructivist Learning to Support Young Children

by

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Abstract

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Young children are spending less time than their parents in unstructured outdoor nature play, due to safety concerns, overscheduling, and academic pressure. They are spending more time indoors engaged in sedentary activities such as television viewing and game play. The increased availability of mobile devices in homes and schools is raising concerns among many groups that exposure and usage of these devices are causing delays in the cognitive, social, mental, and physical development of young children. This paper reviews research on children's screen time and usage, as well as the importance of unstructured outdoor play. It then examines ways to take mobile devices outdoors with children in kindergarten and grade one as a tool for documentation, collaboration, and exploration.

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Dedication

To all the teachers bravely rethinking the traditional classroom model.

And to my friend and mentor, for your support along the way.

Chapter One: Research Overview

Research Overview

This paper and project explores the importance of outdoor experiences for young learners. The influx of different types of technology into the lives of young children, the busy lives of families, and the fear of child endangerment while involved in unstructured outdoor play has allowed for a generation of children to develop a disconnect to the outdoor environment (Kimbro, Brooks-Gunn, & McLanahan, 2011; Klopfer & Sheldon, 2010; Staempfli, 2008). School administrators and educators can fill this void by providing opportunities to students that are experiential, nature driven, and create a sense of belonging in their local community.

Context and problem statement. Young children are not being provided with enough outdoor, unstructured play, and inquiry time. The benefits of this type of play and exploration are seen in cognitive, physical, and social development (Burriss & Burriss, 2010). A *Position Statement on Outdoor Active Play* (M. Tremblay et al., 2015) recommends that an increase in opportunities for outdoor play at children's homes, schools, and neighbourhood environments can help children develop a variety of healthy habits. Despite the knowledge that outdoor experiences are important for child development, younger children in school are seeing a decline in play opportunities, both indoor and outdoor, with academic expectations being thrust upon them at younger ages (Jarrett, Waite-Stupiansky, & Welteroth, 2009). Technology like iPads, gaming consoles, and iPhones offer many sedentary choices for children at home, and contribute to the average 8.6 hours/day of sedentary time Canadian children are getting (Colley, Garriguet, Janssen, Craig & Clarke, 2011). The research problem I am addressing in my project is

this increase in sedentary behaviour among children and the associated reduction in outdoor play due, in part, to access to technology, prohibitive parenting behaviour, and urbanization.

Purpose and research question. The purpose of my study will be to identify ways that early childhood educators can influence students' mobile technology use in outdoor spaces while moving away from sedentary/indoor behaviour. The research question I will explore is how early childhood educators can blend mobile technology with outdoor experiences to provide opportunities for cognitive, mental health, physical, and social development. This paper shows how students can use their understanding of mobile technology in an outdoor, experiential learning environment which focuses on student interest, passion, and creativity.

Changing the way we facilitate learning in schools can be a daunting and overwhelming task for many educators. My goal is to show how small changes to routines and planning can bring about positive changes in student engagement, curiosity and thinking. In the sections to follow, I will review the history of technology, the controversy in its application for young learners, and the disappearance of outdoor play.

History of Technology

Technology has been part of human existence beginning with stone tools used in prehistoric time approximately 2.6 million years ago. Curiosity, necessity, and a desire to learn about the world has given the term technology many different variations and meanings. Johannes Gutenburg's printing press revolutionized how information was produced and spread; Thomas Edison's research on improving electrical light lead to the first commercial light bulb. Even paper was considered a technological advance in the 2nd

century. The word technology continues to evolve and define a variety of areas in modern life.

Throughout educational history, technological advances have been heralded as ways to revolutionize education. The advent of motion pictures at the beginning of the 20th century carried hopes that this media would improve learning. The idea was that films would be able to replace textbooks, and students would learn by watching filmstrips (Mayer, 2014, pp. 13–14). Similarly, in the 1930's and 40's, radio receivers were going to impact classroom practice, by allowing students and teachers to connect across the globe and have access to the world's finest teachers and great leaders (Mayer, 2014, p. 14). Television in the 1950's was the next technology that was introduced where the educational programming on television would be in schools, allowing students of all ages with opportunities and avenues to learn (Mayer, 2014, p. 14). Computers are the most recent educational technology to supposedly reform how students learn and teachers instruct. This technology has had more long lasting and positive effects on instruction, but has not evolved from teacher-led instruction to student-led (Mayer, 2014, pp. 14–15). Educational policymakers and administration are now faced with the onslaught of mobile, tablet technology in schools. Once again claims are being made that this technology will change how we teach and how students learn. Student-centred learning, not technology centered, is an important philosophy to remember as policymakers, administrators, and educators integrate mobile technology into the education system and the hands of students (Mayer, 2014, p. 15). It is important to be cognizant that the student is the center of the learning, not the technological tool being used.

The Controversy of Technology and Young Learners

The idea of tablets in the hands of young learners has become controversial with critics claiming that young learners do not need to have access to these tools in schools. The argument has been brought up that bringing these devices into schools and into the hands of children will be the downfall of their creativity and social development (Plowman, McPake, & Stephen, 2010). Governments and pediatric associations across the globe are recommending screen time limits for children of all ages, which has further fuelled the debate over mobile technology in early childhood classrooms. However, in Dewey's publication, *My Pedagogic Creed* (1929), he discusses the importance of real world learning; that education or school life, should represent the present life of the child. Learning should, for children, reflect what he or she knows of the world, the home, the school, and the playground. If educators are to follow Dewey's ideal, then children should be able to use mobile devices as they are a large part of the environment that students know. Children coming into Kindergarten have almost all used a parent's device, whether for movie viewing or playing an application or game (Rideout, 2013). Most of these young learners are able to navigate the touch screen motions of "swipe and tap" with ease and comfort, and have knowledge of tablet game playing (Neumann, 2014). These devices are a part of their home life, and teachers have a responsibility to use them as a tool in their learning; not as a digital worksheet or a quiet activity (Alper, 2011; Harwood, Bajovic, Woloshyn, Di Cesare, Lane, Scott, 2015; Rideout, 2013). A shift in thinking must occur for these tools to be used for collaboration and creativity while showing students device safety, and device self-regulation. A joint position statement on technology and interactive media by the National Association for the Education of Young

Children (NAEYC), the Fred Rogers Center for Early Learning, and Children's Media at Saint Vincent College (2012), states that

> Adults have a responsibility to protect and empower children—to protect them in a way that helps them develop the skills they need to ultimately protect themselves as they grow—and to help children learn to ask questions and think critically about the technologies and media they use (p. 10).

Educators have a responsibility to safely expose and model developmentally appropriate uses of mobile technology and media to their students, including young children. These students:

> …need to develop knowledge of and experiences with technology and media as tools, to differentiate between appropriate and inappropriate uses, and to begin to understand the consequences of inappropriate uses (National Association for the Education of Young Children., 2012, p. 10).

Disappearance of Outdoor Play

The world of young children has changed with our technological development. Mobile technology is not the only example of technological distractions for young learners, and their world of play now contains many other types of screen media devices. Some of these technological devices include televisions, gaming consoles, and computers in homes, and also in some cars. As a result of the busy lives of parents, there is an aspect of home life, which is slowly disappearing; the world of outdoor, unstructured play (Klopfer & Sheldon, 2010). Many young children are given opportunities to play, but it is often inside where they can be watched, kept from harm, and confined to a smaller play area, even during the school day (Blanchet-Cohen & Elliot, 2011; Clements, 2004).

Unstructured play is often viewed as dangerous, although this type of play is considered developmentally appropriate and needed for physical and social development (Burriss & Burriss, 2010; Klopfer & Sheldon, 2010). Children are often enrolled in outdoor sporting activities such as soccer, and t-ball, as a way to engage with peers and to provide children with fresh air, but the notion of free play is slowly diminishing (Clements, 2004). The unstructured outdoor play of 20 years ago, has been replaced with sterilized playgrounds where children are prevented from climbing trees, jumping on logs, and tumbling down hills (Blanchet-Cohen & Elliot, 2011). Schools, during recess times, prohibit the use of sticks and rocks, and any form of play fighting is seen as aggression (ParticipACTION, 2015). Isolation from the natural environments people inhabit, be they urban or rural, are putting children in a position to lose their creativity, imagination, and wonder of the universe they exist in.

Project Description

The focus of this project will be the creation of a website designed for K/1 teachers based on experiences I have had while developing my pedagogical practice over the past two years, in relation to outdoor, place-based learning environments with mobile technology as a learning tool. I will share ideas about the planning, designing, and facilitation of a more hands on, creative, and active approach to learning. Technology integration will be included in a variety of activities and units, with a focus on collaboration and creativity.

Conclusion

Louv writes, in the introduction to *The Nature Principle*, "Utilizing both technology and nature experience will increase our intelligence, creative thinking, and

productivity, giving birth to the hybrid mind" (2011, p. 5). The opportunity to blend the natural curiosity of young children in an outdoor experience with mobile technology tools like digital cameras, sound recording, and more, actively engages a new world of knowledge and exploration for learners. This paper and project will provide ideas and opportunities for educators to think creatively about their own classroom and school's outdoor learning and mobile technology usage.

Chapter two consists of a literature review with four main sections. The first comprises the theoretical framework. Section two reviews the current literature on screen time recommendations and guidelines, screen media usage in children under 10, and how mobile tablet technology is being used in primary classrooms. Section three looks at the natural curiosity of young learners, the disappearance and benefits of unstructured outdoor play, and how schools can fill the gap. The final section explores the idea of how mobile technology is currently being used in outdoor learning environments.

Chapter Two: Theoretical Framework and Literature Review

Theoretical Framework

. Changes in education are sometimes likened to a pendulum swinging, but the role of the teacher has, for the past hundred or so years, been to provide information for students to memorize and recall. Educational theorists have, in the past, provided teachers with a variety of learning theories, paradigms, and models on ways to teach and learn, but until recently, the traditional model of imparting knowledge has remained. The role of teacher is presently evolving into one of facilitator, where teachers are meant to provide opportunities and support as students construct meaning and understanding of their thought processes. The project created for this paper has focussed on a learning theory known as constructivism. There are many educational psychologists and theorists who have adapted John Dewey's original constructivist writings, thereby creating a constructivist umbrella, which includes social, critical, and cultural constructivism. The constructivist theory is reflected in the project as it looks at the notion of integrating nature, mobile technology, and active learning. In particular, lessons, activities, and projects were created with the idea that learning is student-centered, active and experiential, and that the environment can act as an important contributor to a student's learning.

Learning is student-centered. The idea of student-centered learning is not a new, modern idea. It is, however, a characteristic of the educational theory known as constructivism. Educational theorists such as Dewey, Malaguzzi, and Piaget all wrote about student passion and curiosity acting as the driver of curriculum, rather than the traditional idea of memorization and recall (Hung, Tan &Koh, 2006). Dewey's belief was

that the subject areas of curriculum should come from the social activities of the child, and should not be taught in isolation of each other. He wrote, "if education is life, all life has, from the outset, a scientific aspect, an aspect of art and culture, and an aspect of communication" (Dewey, 1929, p. 37). Jean Piaget, an educational theorist, looked at student-centered learning as a self-initiated**,** self-directed activity. He argued that "learning is dependent on exploration, discovery, first-hand experience, and the child's ability to construct sense and meaning at a predominantly individual level" (as cited in Wood & Bennett, 1998, p. 19)**.**

The student-centered aspect of constructivist theory allows students flexibility to test their ideas through experiments and exploration (Hung et al., 2006). Malaguzzi, founder of the Reggio Emilia approach, described children as "powerful, competent, creative, curious, and full of potential and ambitious desires" (as cited in Kim & Darling, 2009, p. 138). The student, or child, in the Reggio Emilia context is curious about the world around them and has questions to ask, experiments to try, and desires the time to come up with answers. Teachers who follow the Reggio Emilia approach help to facilitate projects where students can explore materials, concepts, and feelings while constructing knowledge through collaboration with peers and discussions with others (Kim & Darling, 2009). Dewey suggests, in Experience and Education**,** a philosophy that supports a necessary unity "in the idea that there is an intimate and necessary relation between the processes of actual experience and education" (Dewey, 1998, p. 7). Allowing teachers to develop projects, activities, and studies that connect the student's world to content creates learning experiences which are more meaningful and engaging to individual children (Pieratt, 2010).

Learning is active and experiential. The constructivist theory also promotes education as an active process where students are encouraged to explore the world and objects around them to construct meaning. Constructivism, according to Bruner, is a process where students are removed from the passive learner role, and provided teacher-facilitated opportunities to learn new information (Ferguson, 2001). Piaget's research on the development of reasoning and young children's construction of knowledge lead Piagetian educators to distinguish between three kinds of knowledge, one of which is physical knowledge (Kato & Kamii, 2001). Physical knowledge involves activities where students experiment to figure out how things in the physical world work (Kato & Van Meeteren, 2008). Through teacher-facilitated provocations and projects, students encounter an important aspect of physical knowledge activities: the possibility of failure. Students are encouraged by teachers to work through activities in order to determine why a projected outcome did not occur, and through the process of trying new ideas, they construct new knowledge (Kato & Kamii, 2001). The addition of new information to the preconceived ideas of students creates cognitive conflict or disequilibrium (Ray, 2002). Active learning environments provide students with opportunities and time to experiment, fail, and retest theories and ideas in order to resolve cognitive conflict through the construction of new concepts, beliefs, and processes.

Allowing students to play and explore during the school day provides them with these opportunities. The idea of guided play involves teachers creating "flexible, interest-driven experiences" (Fisher, Hirsh-Pasek, Newcombe, & Golinkoff, 2013, p. 1872) which engage the natural curiosity of the student and aid in developing the processes needed to make sense of the world. Dewey defined education in *Democracy and Education* as "that

reconstruction or re-organization of experiences which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience" (Dewey, 1916, pp. 89–90). The idea of an experience, according to Dewey, is an individual, such as a student, engaging with their environment (Ord, 2009). The Reggio Emilia approach also encourages active, experiential learning through relationship building, small group work, and collaboration. The relationships that are developed during active learning experiences allow students to discuss their theories, understandings and interpretations of their understandings, while offering opportunities to adjust their ideas as new thoughts are developed and discussed (Kim & Darling, 2009).

Kolb's Experiential Theory uses a four stage learning cycle model to demonstrate how "experience is translated through reflection into concepts, which in turn are used as guides for active experimentation and the choice of new experiences" (Healey & Jenkins, 2007). Educators may use this model as students engage in teacher-facilitated provocations and activities in order to gain feedback and develop further learning opportunities. Although Kolb's theory is often used with older students in activities such as laboratory sessions and experiences in the field, it can be used as a model when developing activities for younger students (Ethridge & Branscomb, 2009). As young students engage in teacher-facilitated activities, they encounter opportunities to reflect and construct new knowledge through collaboration and discussion, which leads to new questions and experiences.

The environment as the third teacher. The idea that children learn best when they are provided opportunities to actively explore the environment around them is based on the theories of Dewey and Piaget (Haas & Ashman, 2014). In the early 1900s, Dewey

saw a school system where students were not able to connect their experiences of daily life to the classroom, and the classroom learning was not applicable to their daily lives (McInerney, Smyth, & Down, 2011). He saw this as "fragmentary and artificial, to the detriment of children's ability to understand systems and processes" (Haas & Ashman, 2014, p. 23) . Froebel, an educationalist who laid the foundations for Kindergarten, believed in the importance of experiential nature play to aid in child development. His knowledge of biology and love for nature informed his ideas of a child's garden and he encouraged children to explore the plants and wildlife both in the garden and in the countryside (Garrick, 2009).

Malaguzzi included the indoor and outdoor environment as the third teacher in the Reggio Emilia approach. Educators who follow the Reggio Emilia approach believe that the environment should allow the learner and educator to express their curious nature, their inherent abilities and their untapped potential (Kim & Darling, 2009)**.** Reggio Emilia educators create intentionally planned classroom spaces which are meant to be welcoming, respectful of the students, developmentally appropriate, and more. These spaces often contain many natural elements such as wooden furniture and toys, plants, and loose parts such as rocks, sticks, and seeds. Students are encouraged to explore, create, and construct with these elements while collaborating with others (Torquati & Ernst, 2013)**.** The Reggio Emilia approach also encourages educators to use their outdoor spaces in a thoughtful, developmentally appropriate way. This may incorporate local ecosystems such as plant life, insects, and water features, and educators are encouraged to provide many opportunities for students to explore, play, and investigate the natural world (Torquati & Ernst, 2013). As Haas and Ashman write, "It is important, at this early

stage, to ensure that all children have the widest experience of the world that we can provide" (2014, p. 21), not only to aid in developing their skills, but in providing them with a connection to the world they inhabit.

An education approach known as place based education (PBE) is being adopted by schools and educators in many countries. This approach incorporates the ideas of Dewey, Froebel, and Malaguzzi as PBE allows students to "make sense of themselves and their surroundings" (McInerney et al., 2011, p. 5). The core idea of PBE is to immerse students in local culture and heritage, landscapes, and experiences. Educators use the local community and environment as springboards for curricular learning (McInerney et al., 2011; Smith, 2002). PBE is not only a way for students to connect to their environment, but this approach encourages opportunities for students to interact with, learn, and help to care for the social and ecological well-being of the communities they live in. PBE taps into the natural curiosity students have of the physical world, and allows them an opportunity to be producers of knowledge, instead of just consumers of knowledge (McInerney et al., 2011; Smith, 2002). Place based educators also understand Dewey's suggestion that "children possess minds that are primarily drawn to actual phenomena rather than to ideas about phenomena" (1915, p. 67). A student can read a book about the life cycle of a pumpkin, or they can venture outdoors to plant a seed and help it grow, while discovering the insects and worms in the garden plot and investigating optimal growing conditions.

Active, student-centered learning in the indoor and outdoor environment is possible for teachers in all grades. The educational theories and models presented are

gaining popularity with educators around the world to create engaging learning environments for students of all ages.

The Era of Mobile Devices

This section contains a review of literature found on the recommendations for screen time usage in children 18 and under, on the reported usage of a variety of different technologies with children under the age of eight, and how early childhood educators are currently using mobile technology in the classroom to develop collaboration, social skills, and digital literacy.

Screen media recommendations. Research done in several countries around the world show varying degrees of screen time usage in children and youth (Hesketh, Wake, Graham, & Waters, 2007; Huhman, Lowry, Lee, Fulton, Carlson & Patnode, 2012; Øverby, Klepp, & Bere, 2013). These studies focus on the screen media and mobile devices of that period, and even by the publication of each study, newer technologies and devices have emerged as more relevant or popular screen media. The definition of screen time for the majority of these studies is television, computers, and gaming systems. The more recently published studies (Grymes, Williams, & Henley, 2014; Huisman, 2014; Miller, 2014; Rideout, 2013) start to include tablets and smartphones as screen media devices whose usage needs to be researched.

The popularity of screen-based activities has prompted concerns from health organizations in several countries regarding the amount of recreational screen usage of children (Strasburger, 2011; Tremblay, LeBlanc, Janssen, Kho, Hicks, Murumets, Colley, Duggan, 2011). The American Academy of Pediatrics recommends that parents limit all children to a total of two hours/day of non-educational screen time, and that children and

infants under the age of two avoid any screen type exposure (Strasburger, 2011). The Canadian Society for Exercise Physiology partnered with national groups including the Healthy Active Living and Obesity Research Group and ParticipACTION to develop a set of guidelines for sedentary behaviour in children. These guidelines look at many different sedentary type behaviours, including screen media usage, and have determined that, like the American Academy of Pediatrics, children and youth should spend a maximum of two hours/day on recreational screen time (Tremblay et al., 2011). The Australian government's Department of Health and Ageing has also set screen time recommendations based on the American Academy of Pediatrics (as cited in Sweetser, Johnson, Ozdowska, & Wyeth, 2010). Australia's DoHA recommends that children from birth to the age of two years old have no screen media exposure, and that children aged two to five years old should have less than one hour of screen time per day (as cited in Sweetser et al., 2010).

Screen time usage. The United States of America, Norway, and the United Kingdom are among the countries where studies on screen time and children have been conducted and published with varying results (Huhman et al., 2012; Øverby et al., 2013; Rideout, 2013a; Sisson et al., 2009). An American study, by Huhman et al.(2012), on physical activity and screen time from 2002-2006 showed that screen time usage in children aged 9-13 was remaining stable over the four-year study period. Of the children in the study, 76.4% reported screen time usage under the two-hour guideline (Huhman et al., 2012). A different study by Sisson et al. (2009), completed in America between 2001 and 2006, also reported that screen time in children and adolescents was relatively unchanged. In this study, however, over 47% of participants spent more than two hours a

day in screen time activities, predominantly that of television and video viewing (Sisson et al., 2009). An earlier, similar study from Australia ran from 1999-2001 (Hesketh, Wake, Graham & Waters, 2007). The study by Hesketh et al. followed student screen usage in children, starting when they were aged 5-10 to when they were 8-13 years old. In this study, the screen usage of Australian children increased from 40% of participants meeting the two hour screen usage recommendation at the beginning and 18% meeting that guideline at the end of the study (Hesketh et al., 2007). In contrast, a Norwegian study focussed on screen time usage in children aged 10-12 years old over the period of 2001-2008 and found that screen time usage decreased (Øverby et al., 2013). The Australian and Norwegian studies both recorded observations that older children are more likely to spend over two hours a day on screen technologies, such as television, gaming systems, and personal computers, than younger children (Hesketh et al., 2007; Øverby et al., 2013). Øverby et al. note that younger children are more likely to be supervised and have stricter rules when screen technology and media are being used in the home, and that older children need to access these technologies for homework purposes and studies.

The types of media children are using also appears to transform as children age and as screen technology changes. Despite many studies on correlates between screen time, sedentary behaviour, home environments, and health concerns**,** few studies looked at the separate, unique types of screen time and electronic media used by children and adolescents (Duch, Fisher, Ensari, & Harrington, 2013). Many studies label television viewing, personal computer usage, and electronic gaming as screen time and do not look

at the varying amounts of time spent on each individual screen media device or tool (Duch et al., 2013).

A variety of studies and literature reviews on screen media usage with children under the age of five have investigated the variety of screen devices in children's homes in relation to health and developmental effects and parental views (De Decker et al., 2012; Ernest et al., 2014; Rideout, Hamel, & Foundation, 2006; Sooryamoorthy, 2014; Sweetser et al., 2010). Although these studies were not specifically targeting the amount of time or type of screen media usage in homes, data collected reflected television viewing as the main type of screen usage for children under the age of five. A multi-country study in Europe looked at the parental perceptions of screen time usage in their preschool-aged children (De Decker et al., 2012). This multi-cultural, multi-geographic look at screen time usage of children reported that, in the six participating countries, the most popular type of screen usage was television (De Decker et al.). De Decker et al. also examined computer and gaming console use, but live television, as opposed to video or DVD, was preferred. The Australian Institute of Family Studies also began collecting information on children and their screen media use in 2004 with the Longitudinal Study of Australian Children (LSAC) (Sweetser et al.). Although the LSAC results showed that the majority of study participants, aged two to five years old, were exceeding government screen time recommendations, the screen time was spent in television or DVD viewing as opposed to computer or game console usage (Sweetser et al.).

A recent report by Common Sense Media (Rideout, 2013) contains a detailed look at different types of electronic media used by children from birth to eight. In contrast with many other studies done, the Common Sense Media report breaks down device usage to

specific categories of television, mobile media and apps, computers, video games, and e-reading. Rideout's (2011) initial survey for Common Sense Media was conducted in 2011, and provided a baseline for a secondary survey in 2013. The participants in these surveys were parents of children aged zero to eight, and their results show a difference in screen time usage across the early childhood years (Rideout, 2013; Rideout, 2011). Table 1 from Rideout's 2013 survey highlights some of the media usage results between 2011 and 2013.

Table 1

Media Usage in Children Aged Zero to Eight.

Survey Topic	2011	2013
Tablet ownership in the family	8%	40%
Access to mobile technology	52%	75%
Television watching for at least one hour/day	65%	58%

Note. Adapted from "Zero to eight: Children's media use in America 2013" by V. Rideout, 2013, Common Sense Media

Rideout (2013) reports that the presence of a mobile device in the home does not necessarily mean that all children have access to it, but in the 2013 survey, 72% of the children reported to have used the technology for activities like playing games, watching videos, and using other applications. The amount of time children aged eight and under spend on television viewing is consistent with other research studies, according to the Common Sense Media survey (Rideout, 2013). The nature of television viewing, however, is beginning to see changes. Of the participants in the survey, 96% reported

having a television set in the home, and 70% subscribe to either cable or satellite services (Rideout, 2013).

Television and mobile devices are not the only screen media technologies vying for the attention of children and youth. Personal computer systems and gaming consoles are another potential screen activity to which humans of all ages have access. In 2011, De Decker et al. reported that although many children in the six European countries they surveyed had access to personal computers, most preschool aged children did not use the computer often. The majority of computer use was for educational games like memory, painting, or puzzles (De Decker et al., 2011). Compared to the other competitors for screen time in this age group, video game usage is relatively low with an average of six minutes a day (Rideout, 2013). However, as the children age in this group, video game time grows to an average of 12 minutes/day for children aged five to eight, and Rideout noted that while video game usage is decreasing slightly, she predicts that a shift to mobile tablet gaming may be occurring.

Studies regarding electronic video gaming in adolescents report a growth in usage for children aged eight years and older. For example, Swing and colleagues (2010) found, in a sampling of over 1300 children aged 6 to 12, that the average amount of time spent in video game play was 1.3 hours a day. These children previously reported a television viewing average of 2.9 hours/day, putting them well above the recommended two hour limit (Swing, Gentile, Anderson, & Walsh, 2010). The increases in screen time from birth to adolescence demonstrate that screen media has become part of everyday human life. Educators now face the controversy and challenges of integrating current mobile technologies into classroom learning environments.

Mobile technology in primary school. The influx of tablets and other mobile devices into the educational system is creating new, and sometimes challenging, learning opportunities for teachers and their students. The availability of mobile devices in home environments cannot be ignored by those in the education system. Educators have a responsibility to ensure that younger students are given opportunities to create and discover with these devices, but also to learn responsible digital citizenship skills (National Association for the Education of Young Children., 2012). For younger students, mobile technology, particularly touch screen type tablets, provide educators with a tool to model and practice these skills.

The intuitive nature of the touch screen tablet allows young children access to tools for creation and documentation (Couse & Chen, 2010; Geist, 2012; McManis & Gunnewig, 2012). Younger children quickly pick up the range of physical touch motions to use the tablet, such as the tap, double tap, swipe, pinch and stretch (Neumann & Neumann, 2014). People of any age can use the tablet anywhere, but for children, it allows them the freedom of having it in their laps, laying on the floor, sitting alone or with a group of friends (Merchant, 2015; Michelle M. Neumann & Neumann, 2014).

A common criticism of mobile devices, like the touch screen tablet, in the hands of younger children is the idea that social skill development and collaboration amongst younger students will be delayed (McPake, Plowman, & Stephen, 2013; Strasburger, 2011). Several studies on young children and tablet use have shown that this idea may not be true (Alper, 2011; Harwood et al., 2015; Neumann, 2013; Neumann & Neumann, 2014). The majority of these studies were done with a focus on literacy aspects in classrooms, but the collaborative actions noted in these studies could potentially be

observed in different learning experiences. Educators working effectively with mobile devices in the pre-K through grade three classroom environment, recognize that learning is social, even as it becomes individualized and personalized (Alper, 2011). The interactive nature of mobile technologies enhances the collaborative and participatory nature of young learners (Alper, 2011a; Harwood et al., 2015; Hong & Trepanier-Street, 2004; Kolås, Munkvold, & Thorshaug, 2010). A basic social and collaborative skill that students practice in the primary years is that of sharing. Children in classrooms with a single computer may have discussions with their peers to make recommendations on game play, but a single child controls the mouse (Verenikina, Herrington, Peterson, & Mantei, 2010). Classrooms with access to more devices may find that children gravitate towards more experienced device users for information on an application to use, to help problem solve when they are stuck, or to watch and learn how to use a device or app (Harwood et al., 2015).

Kolås, Munkvold, and Thorshaug (2010) studied the types of social interactions that occurred when children aged three to five were given touchscreens as part of their daily play. They found six different types of interactions between the children, the devices, and their peers (see Table 2).

Table 2

Social Interactions Observed Between Children on Touchscreen Tablets

Interaction	Description
Descriptive	-students discussed what was on their screen and what they were doing
Argumentative	-children discussing, asking, and/or making suggestions to aid a friend
Instructive	-children explaining how to do something to their peers, sometimes modelling -sometimes 2-3 children were using one1 touch screen together
Observing	-non-verbal interaction where, in a group of two or three students sharing a touch screen device, children watch what the others are doing, and sometimes, impatiently touch the screen to hurry others along
Discovery-based	-demonstrated a sense of comfort and self-reliance in the students and their interactions with the device by trying out new software and working ahead of others.
Creative	-creative collaboration where the children used imagination and discussion to determine paint colours and story development

Note. Adapted from "Social interaction types experienced among preschool children (age 3-5) using touch screen technology." by L. Kolås, R. Munkvold, & A. Thorshaug, 2010

A large component of the constructivist Reggio Emilia approach, adopted in many preschool and Kindergarten classrooms, is collaboration. Children in this approach are encouraged to state their opinions and to be able to problem solve in a meaningful way (Hong & Trepanier-Street, 2004). Hong and Trepanier-Street note that these skills are modeled and practiced with teacher facilitators, and through the process, students learn how to critique, discuss, negotiate, and even hypothesize with their peers. Children and educators in these classrooms work together to create a community of decision makers

(Hong & Trepanier-Street, 2004). Teachers in studies (Harwood et al., 2015; Hong & Trepanier-Street, 2004; Trepanier-Street, Hong, & Bauer, 2001) saw the potential in tools, such as digital cameras, video recorders, computers, computer software, and the Internet, to allow younger students ways to represent and document their thinking, while collaborating and problem solving with their peer groups. Younger children see the world in very detailed ways, which are often difficult for their fine motor skills to represent by conventional means (Hong & Trepanier-Street, 2004). The computer software, KidPix, was used by Hong and Trepanier-Street (2004) in an observational study of student teachers and students in early childhood classrooms using the Reggio Emilia approach as their philosophy. This software allowed students to photograph their representations and use letter stamps in the program to create words about their learning and to reflect on their discoveries. As the class began to discuss, research, and document new learning, they were able to use a web tool called Kidspiration to document their discussions. While growing triops, a small crustacean, in the class, students photographed growth with digital cameras and charted growth progress. The student teachers observed that the children in the study would work together on the computer to learn about triops, created KidPix pictures as they discussed what should be included in their work, and shared their knowledge (Hong & Trepanier-Street, 2004). Hong and Trepanier-Street noted teacher concerns that the technology would be too difficult for the children to understand, but by the end, both the teachers and student teachers found that the programs and technology aided the student reflections and understandings on social and cognitive levels (Hong & Trepanier-Street). As research indicates, touch screen tablets and mobile technology can allow similar work to occur in classrooms, and outdoors, with a single device.

Importance of the Natural World

This section investigates the idea that many children are disconnected to the natural, outdoor environment of their communities. Many of these children are not experiencing the cognitive, social, and physical benefits of outdoors experiences, like unstructured play and exploration, for a variety of reasons. This section also looks at how taking children out of the classroom can provide them opportunities they may not receive in their homes.

Naturally curious. Young children have a natural, innate curiosity about how things work and the world around them (Harwood et al., 2015; Waite, 2010; Zorzi, R. & Gagne, 2012). According to Smith (2002), this inborn curiosity is not utilized to its potential in school settings. The initiation-response-evaluation style of many classrooms upholds the traditional, textbook based role of students providing correct responses, rather than active learning based on student interest and experiences (Chen & Looi, 2011; Smith, 2002). Educators and educational administrators are seeing a shift in educational practice to a more hands-on, inquiry style of classroom experience (B. C. M. of Education, 2015; Ontario M. of Education, 2011). Unstructured play and inquiry style exploration are ways where educators can take the role of learning facilitators to give children the freedom to explore their world (Ontario M. of Education, 2011; Langford, 2010). The idea of free, unstructured play is not a new one to many early childhood practitioners, but it is often confined to classroom environments, especially as some places in North America cancel or limit student outdoor recess time (Kirylo,

Thirumurthy, & Patte, 2010) and the academic expectations in early years classrooms are limiting student choice and play.

Losing outdoor unstructured play. Outdoor unstructured play used to consume a large amount of free activity time for children. A 2004 study by Clements found that 70% of participants, all mothers, played outside daily as children, yet only 31% allow their children the same experience. Louv (2008), author of the book, *Last Child in the Woods*, explored the disconnect human beings are currently experiencing with the natural world. Louv coined this disconnect as a non-medical term, Nature Deficit Disorder (NDD), and he noted that children, in particular, are spending less time in direct contact with nature and in unstructured, outdoor play experiences (Driessnack, 2009). Communities and governments do provide parks, school playgrounds, hiking trails, and facilities for urban populations to access, but they are underused (Charles, Louv, Bodner, & Guns, 2008; Kimbro & Schachter, 2011; McCurdy, Winterbottom, Mehta, & Roberts, 2010). Researchers have found a variety of reasons for the lack of outdoor unstructured play with children, including child safety, time constraints, lack of nearby green space, and the comfort in air conditioned indoor spaces (Klopfer & Sheldon, 2010; McCurdy et al., 2010; Tremblay et al., 2015). Child safety is a main concern of many parents, educators, and educational administrators when it comes to outdoor unstructured play experiences. Stranger danger, Amber Alerts, and mass media reporting have created a great sense of fear that children will be abducted if they play outdoors without strict supervision and guidance (Kimbro & Schachter, 2011; Klopfer & Sheldon, 2010; Staempfli, 2008; Veitch, Hume, Salmon, Crawford, & Ball, 2013). Parents did report that children were free to play outside if the family had a yard to play in, but not the open

explorations of unstructured play (Veitch et al., 2013; Veitch, Bagley, Ball, & Salmon, 2006; Veitch, Salmon, & Ball, 2010).

Cognitive benefits of outdoor play. Unstructured outdoor play allows for many cognitive skills to develop, while it helps with physical development and activity in younger children (Ginsburg, 2007). Children in Kindergarten, according to Piaget, are in the preoperational stage of cognitive development (Tannock, 2011). This stage of development consists of two sub-stages: the pre-conceptual period and the intuitive period. During this stage of development, children are starting to experiment with imaginary play and role playing while developing their language and their understanding of symbols (Oakley, 2004, pp. 18–20). Outdoor unstructured play time provides children in this stage opportunities to develop these skills.

Pellegrini and Bohn (2005) describe unstructured playtime as a necessary break from the tasks children may be required to do in a classroom. The nervous system of young students is not yet fully developed and they are unable to do the higher-level cognitive tasks which older students and adults can do (Pellegrini & Bohn, 2005). The addition of higher-level thinking to the curriculum expectations of younger children, puts students who are not cognitively mature into a state of interference, where they are made to repeat highly structured, not developmentally appropriate tasks (Pellegrini & Bohn, 2005). Unstructured play time, like that of recess and outdoor explorations, can help to decrease this learning interference while developing other cognitive skills (Pellegrini & Bohn, 2005).

Ginsburg's report to the American Academy of Pediatrics describes unstructured or "undirected play" as a way to allow "children to learn how to work in

groups, to share, to negotiate, to resolve conflicts, and to learn self-advocacy skills" (Ginsburg, 2007, p. 183). Ginsburg further explains that when play is adult-led or controlled, children lose some of the benefits of unstructured play, most notably the development of creativity, leadership and group skills. Beyer, Bizub, Szabo, Heller, Kistner, Shawgo and Zetts (2014) found, in their development and pilot of the Attitudes Toward Outdoor Play (ATOP) scale, that students enjoyed the creative, unstructured play in the outdoors, in part, because they enjoyed creating new games. Fjørtoft and Sageie (2000) and Herrington and Studtmann (1998) reported that students were more likely to explore the abundance of loose parts in nature, instead of playing on manufactured playground equipment. Unstructured play and outdoor learning allow for students to confront relevant problems and engage in real-life scenarios (Burriss & Burriss, 2010). In their review of national school board policies and outdoor learning, Burriss and Burriss noted which actions, such as gaining access to playground equipment, finding friends to play with, or creating a role play situation or game, required students to think about the perspective of others in the outdoors with them. The physical environment of the outdoor education setting can also provide cognitive benefits, as children are required to problem solve their way down from structures, think of creative ways to use natural objects, and focus on the rules of created games (Burdette & Whittaker, 2005).

Mental health benefits of outdoor play. There are many studies on the effects of nature on mental well-being in humans. Bowler, Buyung-Ali, and Pullin (2010) conducted a systematic review of 25 studies which related outdoor exposure to health benefits. Bowler et al. found that being outside in a natural environment had a consistent reduction in negative emotions like anger and sadness, while positively impacting energy

levels and attention. Results from the ATOP scale by Beyer and colleagues showed that children agreed with the mental health benefits of being outdoors, saying that playing outdoors "helps them to think more clearly" (Beyer et al., 2014, p. 257) and calmed them when they were angry. Recess and outdoor activities, according to Burriss and Burriss (2010), may be the only time of the school day where some children receive positive reinforcement. During outdoor explorations or playtimes, some children may be free to demonstrate knowledge or skills that are non-curricular. Children who are comfortable in the outdoor environment may receive recognition for tree climbing and jumping, or may have extensive knowledge about the plant and bug life found in the outdoor environment. This can, in turn, lead children who struggle in curricular areas to feel valued and appreciated by their peers.

Physical benefits of outdoor play. Physical development is another area of child development that is positively affected by outdoor experiences like unstructured play. The student response to the ATOP scale by Beyer, Bizub, Szabo, Heller, Kistner, Shawgo and Zetts (2014), showed that students as young as nine realized that outdoor experiences made them healthier. Several studies have shown that physical activity levels of children are higher when they are outdoors, rather than indoors (Gray, Gibbons, Larouche, Sandseter, Bienenstock, Brussoni, Chabot, Herrington…Tremblay, 2015; Tremblay et al., 2015; Vanderloo, Tucker, Johnson, & Holmes, 2013). The *Position Statement on Active Outdoor Play* by Tremblay et al. (2015) found that outdoor time was not associated with low physical activity or an increase in sedentary time. Many of the activities associated with young children and outdoor unstructured play, such as jumping, running, and performing gymnastics, actually aids in the development of their bone mineral density

(Hind & Burrows, 2007; Kemper, Twisk, Van Mechelen, Post, Roos & Lips, 2000). Physical activities, including jumping, running, kicking, swinging, rolling, and more, all aid in providing renewed blood to the brain, and help support a large number of neuron connections (Burriss & Burriss, 2010). Research by Dale, Corbin and Dale (2000) found that children who did not experience physical activity, like recess or unstructured outdoor play, did not seek to compensate inactivity after school. Children who engaged in after school physical activities were most often those who had experienced physical activity during the school day (Dale, Corbin, & Dale, 2000).

Social development during outdoor play. Outdoor unstructured play can help benefit prosocial behaviours in children of all ages, as they practice social strategies being introduced at school, which are needed to enter into and maintain play situations (Burriss & Burriss, 2010). Burdette (2005) reports that entering into and maintaining a play situation with others, requires children to problem solve a variety of social problems, like deciding who to play with, what the activity is, rules of play, and how to be invited into a game. Problem solving these play dilemmas can help cultivate social skills, such as empathy, reconciliation, sharing, cooperation, and self-awareness, which are all necessary for social interactions through their lives (Burdette & Whittaker, 2005; Burriss & Burriss, 2010). Children, when they are involved in outdoor, unstructured play experiences, also learn to aid their peers, which develops a feeling of satisfaction and competence (Katz & McClellan, 1997). Synodi (2010) compared Kindergarten play experiences between the United States, Norway, Sweden and Japan, and described free play in Japan as a way for children to learn ways to resolve relationship difficulties, and to develop their social emotional skills. Whitburn (2003) reported, during her observations of early childhood

education models in Japan, that during free play opportunities, indoor and outdoor, children were allowed to do activities of their own choosing. Teacher intervention and mediation was not observed by Whitburn, as the children gradually learned how resolve their own difficulties and developed an understanding of group behaviour. In Japanese early childhood classrooms, free play is perceived as "an instrument for learning in order to develop a framework for a feeling of a class spirit" (Whitburn, 2003, p. 170).

Azlina (2012) conducted an experimental study on children aged 4-6 in Kuala Lumpur to determine how outdoor play environments can influence child behaviour. During this study, Azlina noted that social play occurred in the outdoor area when children engaged in imaginative play, turn taking, loose part construction, and exploration. McArdle, Harrison and Harrison (2013) examined the effects of a nurturing approach in an outdoor play environment on children from a challenging background. The researchers noted that the children visibly relaxed, and began to talk with others during their walks to the outdoor play environment (McArdle, Harrison & Harrison, 2013). McArdle, Harrison and Harrison interviewed the teachers involved, regarding their identified "challenging" students. Teachers reported that these identified children had improvements in social communication, turn taking, and inclusion of other children.

Schools and outdoor experiences. The many benefits of outdoor play and experiences cannot be ignored by educators. Schools have the ability to provide students with the outdoor exploration and learning they are may not be receiving at home. Nordic and mainland European countries, as well as parts of the United Kingdom have been

incorporating aspects of outdoor education for the past decade (MacQuarrie, Nugent, & Warden, 2013).

The Danish concept of outdoor learning at school is called “udeskole” and does not appear in any of Denmark’s formal curriculum (Waite, Bølling, & Bentsen, 2015). Waite, Bølling and Bentsen describe the udeskole as a “bottoms-up educational grassroots movement” (p. 8) that has started due to the individual initiative of teachers and schools moving to the local, outdoor environments for some of their teaching. The goals of the teachers in the udeskole movement are to provide students with activities to promote concentration and to offer support for student outcomes and learning. Taking students out to local, outdoor environments allows them to contextualise their learning by providing real world authenticity and promoting the curiosity of students (Waite et al., 2015).

Forest schools are the adaptation to the udeskole in England (Elliott, 2014; Waite, Bølling, & Bentsen, 2015). These schools offer repeated opportunities for students to be in the local environment, by offering one half day outside a week. According to Waite et al., (2015) forest schools have specific learning outcomes for students, and have four main goals for the students who attend. These goals are:

1) the development of self-confidence and self-esteem
2) behavioural, social, emotional wellbeing
3) physical health
4) awareness and respect for the natural environment.

These goals support the idea of whole child development, with a focus on meeting the needs of the child, the competencies and attitudes to promote academic learning, and an awareness of nature (Waite et al., 2015).

The udeskole movement in Denmark and the forest schools of England have provided inspiration to educators in other parts of the world to look around their schoolyards and communities for ways to bring students into the outdoors. Moffett (2011) researched a group of student teachers trying a concept called math trails in the outdoors with primary level students. A math trail is described by Moffett as a trail which "uses the resources and features within the environment as a stimulus for mathematical activities" (p. 280). Math trails can be set up and completed indoors or outdoors, but the activity allows for real world math experiences. The student teachers had concerns regarding going outside for the activity, in particular behaviour management and inclement weather, but reported afterwards that the children, teachers, and student teachers were enthusiastic and motivated. The novel outdoor experience brought the student teachers awareness that engaging in learning was much more motivating to students than seatwork (Moffett, 2011).

Nedovic and Morrissey (2013) conducted an action research project at a preschool setting in Melbourne, Australia. During the redevelopment of the outdoor play area, teachers created a list of items they would like to see in the space, and had their students draw and discuss the elements they would like. There were several common elements listed with a preference for natural items including plant life, water, and soil/mud. Over the five-week period of redevelopment, students were allowed access to the new additions in the space. Nedovic and Morrissey noted the teacher observations on child

behaviour in the garden space. The teachers noticed that when the greenery and flowers were added, the children ceased running and began travelling more cautiously around the plant life. Students were often seen at flower tubs examining the plants and the insects around them, and the students displayed a sense of calm when surrounded by the greenery in the outdoor space. Students were observed collecting rocks to create spirals, counting tree rings in stumps, and measuring water and soil to create proper mixtures for the potted plants.

The experiential learning that can occur while students are in a known, outdoor environment can lead to unique investigations, both academic and self-reflective. Ghafouri (2012) spent time observing the nature encounters of a junior/senior Kindergarten class in Toronto, Canada. The teacher and students would spend time in the park behind the school playground as an extension of their classroom environment. Ghafouri observed the children when a deceased squirrel was found in the park. Rather than sending the children away, the teacher guided the students' curiosity in a safe manner and allowed students to theorize what had happened to the animal. This experience continued for some time, with students drawing the animal in the park and in the classroom, debating what had happened to the squirrel and discussing whether the animal was alive or dead. The children, with the aid of the teacher, were allowed to construct their knowledge, rather than having answers provided to them. Ghafouri notes, in this nature situation, that bringing children into the outdoors can have implications, but that educators can give their students a safe way to investigate some difficult concepts.

Educational Experiences with Mobile Devices in Nature

Mobile technology has been used as a learning tool in museums and exhibits for a number of years (Avraamidou, 2013; Land & Zimmerman, 2015; Tan, Liu, & Chang, 2007; Yatani, Onuma, Sugimoto, & Kusunoki, 2004). Online guidebooks or multimedia guides allow for visitors to access information independently, rather than seeking out a museum docent. Educators have started using mobile devices in similar ways when taking students into outdoor learning experiences (Chen, Kao, & Sheu, 2003; Chen, Kao, & Sheu, 2005; Huang, Lin, & Cheng, 2010; Lai, Chang, Wen-Shiane, Fan, & Wu, 2013; Land & Zimmerman, 2015; Rogers et al., 2004). The research focus for these studies center around science outcomes from upper elementary aged or high school curriculum.

Lai and colleagues (2007) used Personal Digital Assistant or PDAs with students in a series of experiential learning opportunities on plants. A system called "mobile-learning passport" or MLP was developed to help guide and motivate students while learning in the school gardens. Grade five students in two classes were the study participants, with one class using the mobile device, and the other using pencil and paper research and documentation methods. Students were required to photograph or sketch plants, record their sensory responses to the plants, check for deeper understanding, formulate questions about the plants, and submit a final report on their findings. Lai et al. (2007) found that students who used the PDA and MLP system outperformed the control group in knowledge creation. However, the PDA students reported a decrease in the observations after the initial photography stage, and researchers found the PDA students had difficulties in the questioning phase.

A 2010 research study by Huang and colleagues designed a Mobile Plant Learning System (MLPS) to improve the development and learning of plant curriculum in Taiwan. The main learning activity for this study was to investigate plant life in the outdoors, and the students involved were divided into two groups. One group was provided with PDAs equipped with wireless communication technology to aid in their exploration, and the second, control group was provided with guidebooks and pencil and paper tools. The student participants in both groups were given similar activities and guidance from the educator, beginning with instruction and practice with the MLPS. Some of the activities included observing leaves, naming plants and their function, identifying plant type and category, as well as reporting out their discoveries in a variety of ways. These activities were planned to encourage social interaction and conversation between students, and activity times were equally balanced to allow for collaboration with peers, guidance from instructors, and exploration in the outdoor environment. The course instructor reported from observations and journal reading, that student engagement and motivation was increased in the MLPS group, while the control group appeared reluctant to be involved in activities. The instructor further suggests that "speed of access to information appeared to influence the behavior of students in each group" (p. 55). Huang and colleagues concluded that preliminary evidence suggests mobile devices and outdoor learning are compatible when learning about local plant life.

A study conducted by Boyce, Mishra, Halverson and Thomas, (2014) investigated the impact of iPad use on student engagement and learning during nature hikes with middle school students described as underrepresented. Researchers developed a program intended to increase STEM education and to promote environmental awareness. A GO

iPad application was designed to pair with the tablet camera and notebook app for students to document and complete activities on during the hikes. Ten stations were designed with Look, Listen and Touch activities for students to complete and document with the iPad tools. Students were given instruction on the iPad applications, divided into smaller groups and sent on the nature hike with two trained naturalists from the wildlife center. Boyce and colleagues found that students were initially excited to "play" with the iPads, but by the second hike, were more focussed on using it as a research and documentation tool. Researchers also noted a difference in application use between the two nature experiences. The students took many more photographs on the first hike than the second, although many of the pictures were of their friends or themselves. On the second hike, student iPad usage appeared more purposeful, with student photographs focussing on what the naturalist guide was showing, and the notepad application being used more for field notes. At the conclusion of the study, educators reported that many of the students expressed a wish to return to the site for further educational experiences. Boyce et al. concluded that the inclusion of mobile technology on guided nature hikes can aid in student engagement and recall in underrepresented students.

Research conducted on outdoor learning experiences with mobile devices show a positive outcome for student engagement and retention (Avraamidou, 2013; Boyce et al., 2014; Chen et al., 2003; Chen et al., 2005; Lai et al., 2013). Most of this research, however, centers on upper elementary, middle school and high school level students (Blatt, 2013; Boyce et al., 2014; Chen et al., 2005; Huang et al., 2010; Lai, 2013; Liu, Peng, Wu, & Lin, 2009), and focuses on aspects of the science curriculum. Although researchers reported positive results on student engagement and knowledge retention,

they also suggest that further research be conducted on topics, including students' split attention during outdoor, mobile device activities (Boyce et al., 2014). Huang and colleagues suggest that friendlier user interfaces are required to improve student use, and to cultivate the students' familiarity with the tools they are using, before entering the field.

Conclusion

In conclusion, mobile devices and tablet technology are a part of our everyday lives. Educators, administrators and policymakers continue to investigate ways in which these devices can be used to enhance learning, while developing social and emotional skills. However, there is concern and debate over the use of these tools in school settings as they are believed to contribute to the sedentary lifestyle of children. The ParticiPACtion Report Card on Physical Activity for Children and Youth (2015) shows that children are spending less time in outdoor play experiences and more time inside. This does not mean that children are indoors on screens, but they are not outdoors exploring the environment around them. Parental fears over abduction and injury are affecting the amount of time children spend organizing their own games and play experiences. Schools, however, have the opportunity to blend mobile technology with outdoor structured and unstructured learning experiences to help develop the social, emotional, physical, and cognitive skills of students. Providing students with time in the school day to explore their interests in an outdoor setting with their peers allows for collaborative processes to occur, while developing emotional and physical skills. The use of mobile devices in areas outside of the classroom can encourage engagement with the environment, curiosity and exploration, and allows children who may not thrive in a

classroom setting, the opportunity to showcase their abilities and knowledge. As the NAEYC position paper on technology in early childhood classrooms states, “Technology and media can enhance early childhood practice when integrated into the environment, curriculum, and daily routines” (NAEYC, 2012, p. 8).

Chapter Three: Website Project

Website Overview

The project I created is a website for Kindergarten and grade one teachers who are starting to explore outdoor learning environments with their students. The familiarity I have with students in this age range is the reason for my narrow grade focus. I decided to concentrate on urban environments as my teaching experience has been at schools in urban areas with little to no access to large wooded, forest-like areas. Recommendations from the 2015 ParticipACTION Report Card on Physical Activity and Youth state that educators and caregivers should "regularly embrace the outdoors for learning, socialization and physical activity opportunities, in various weather conditions—including rain and snow" (p. 9). The outdoor exploration focus of this website involved the creation of activities and lessons to help guide teachers in outdoor exploration times. The website format provides opportunities for me to add, delete, and adapt content as I continue to experience outdoor learning with students

Introducing Urban Puddle Jumpers

I chose to use Wix as the website platform and chose the name Urban Puddle Jumpers to combine the urban environment I teach in with a favourite activity of my young students. The photographs at the bottom of the home screen (Figure 1) are direct links to pages on the website where activities, lessons, resources, and information can be found. The toolbar at the top of the screen (Figure 1) is divided into large sections including one where teachers can find management tips and activities, one for each school season in B.C., contact information, and resources which I have found helpful on

my learning journey. The toolbar is visible on all pages of the website to support navigation.

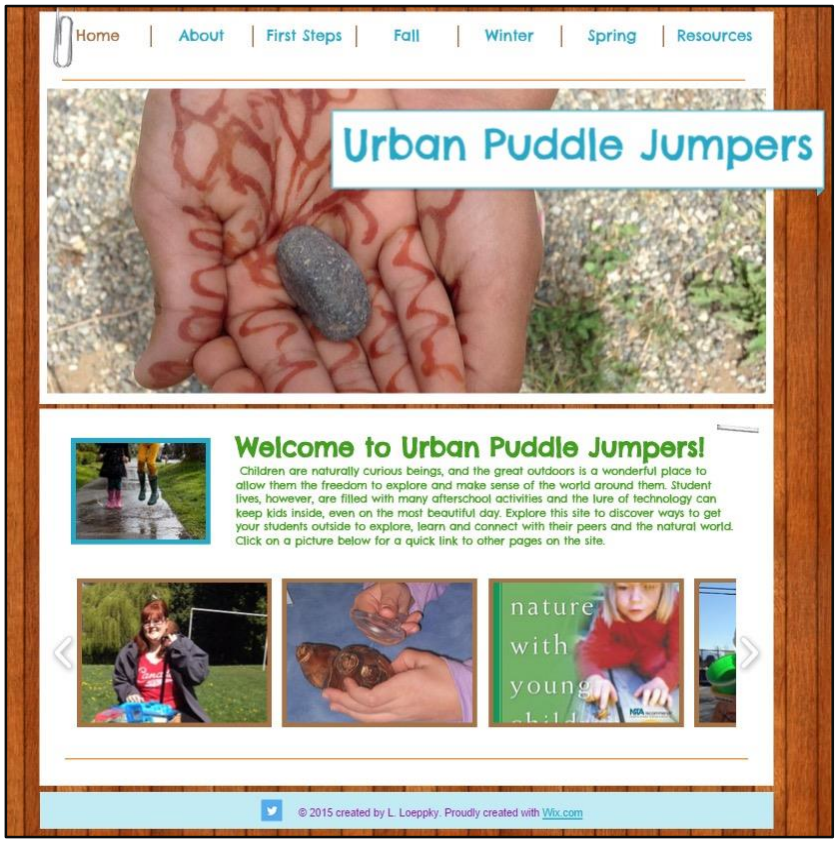


Figure 1. Urban Puddle Jumpers.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers

The learning journey I have been on with outdoor explorations, is a fairly new one. The About page (Figure 2), contains some background information on myself so that visitors to the site are aware of my recent adoption of this style of learning, and to hopefully show that teaching philosophy and pedagogy can evolve at any time during a career. A link to the Contact Me page is located at the bottom for visitors to contact me if they have questions about the activities, suggestions for the website, or ideas they may wish to share.

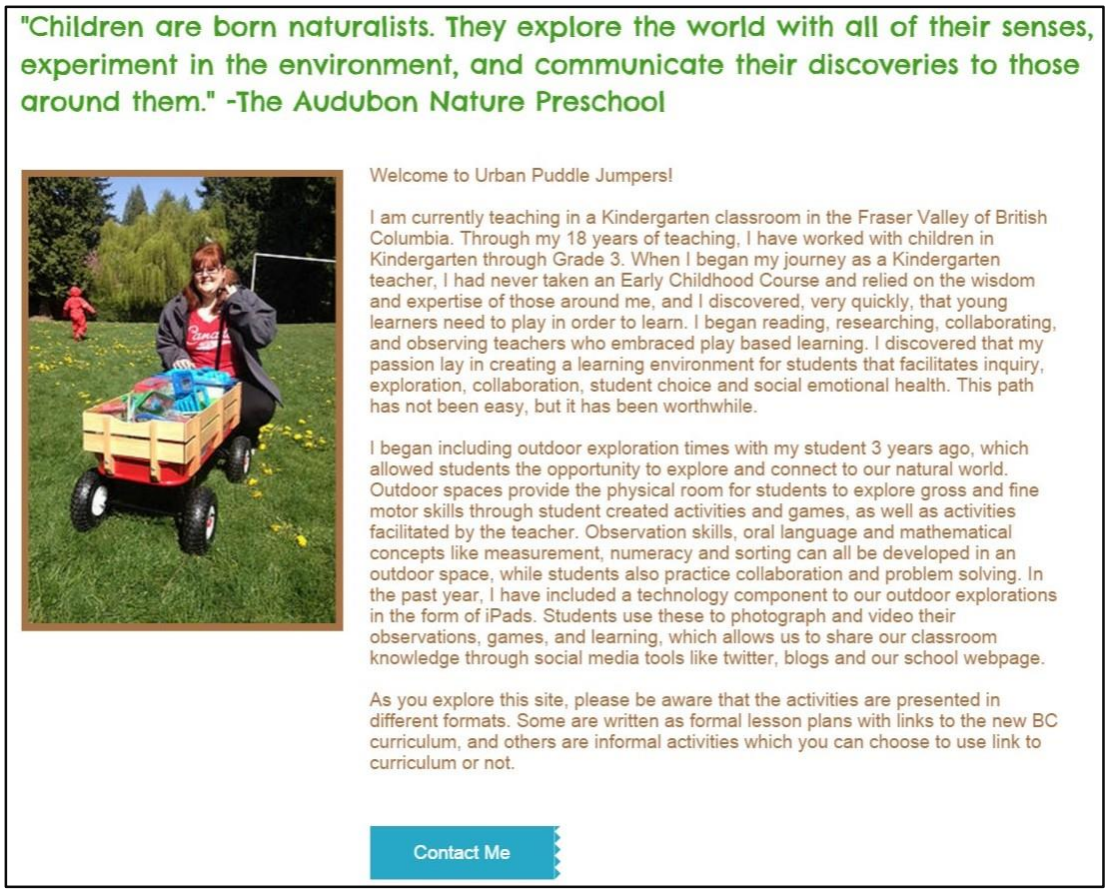


Figure 2. About Page
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!about/c1wfv

First Steps

The First Steps section is important as teachers often ask me how to begin outdoor explorations with students (Figure 3). Outdoor classroom management skills are as important to the teacher as indoor classroom management skills. Teachers need to be confident that their classroom management skills will be effective when engaging young students in an outdoor learning environment. They need to know that their students will listen and respond to signals and instructions while outdoors. Several activities are included in the On the Blacktop and Grassy Spaces subpages of the First Steps section to help teachers with outdoor classroom management.

Figure 3. First Steps
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!first-steps/fkeiu

Management Tips. A list of tips is included on the Management Tips page (Figure 4) to help teachers prepare themselves for outdoor explorations. This list of tips is meant as a guide only, from personal experience, and teachers of any primary grade level can adapt it to suit their classroom needs.

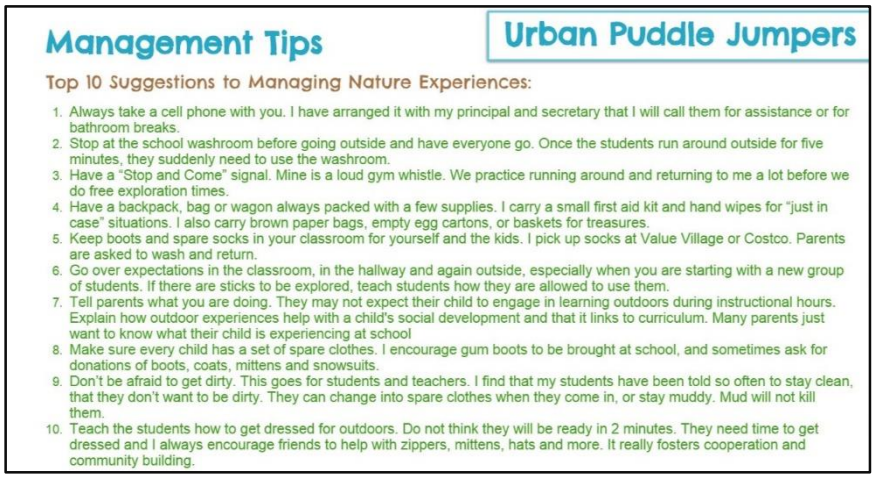
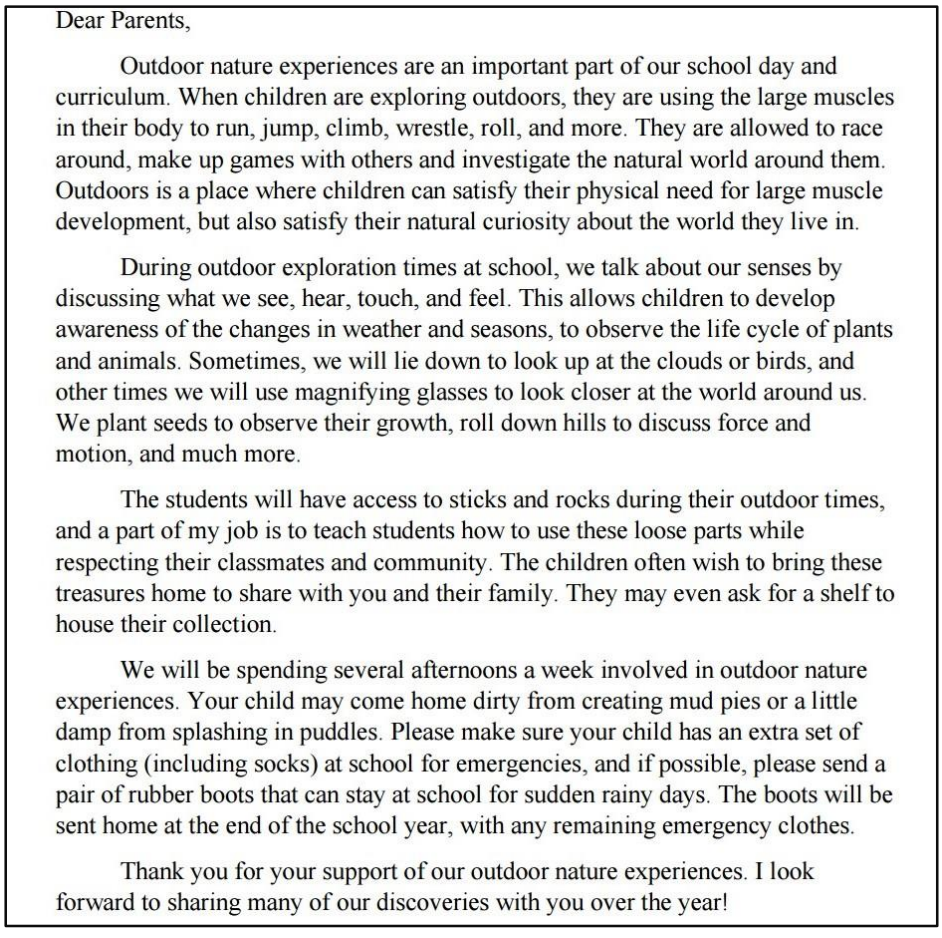


Figure 4. Management Tips
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!management-tips/hp2yy

Letters to parents. Classroom parents may not expect their child to spend class time outdoors getting dirty and exploring. Information on outdoor exploration times and the learning it can provide is often helpful to parents. A parent letter (Figure 5) regarding the importance of outdoor exploration, as well as several reminder letters about outerwear, is included on the Management page. Each school is different, but asking the school community for good condition, used warm weather clothing and rain gear can help provide students with outdoor clothing.



Dear Parents,

Outdoor nature experiences are an important part of our school day and curriculum. When children are exploring outdoors, they are using the large muscles in their body to run, jump, climb, wrestle, roll, and more. They are allowed to race around, make up games with others and investigate the natural world around them. Outdoors is a place where children can satisfy their physical need for large muscle development, but also satisfy their natural curiosity about the world they live in.

During outdoor exploration times at school, we talk about our senses by discussing what we see, hear, touch, and feel. This allows children to develop awareness of the changes in weather and seasons, to observe the life cycle of plants and animals. Sometimes, we will lie down to look up at the clouds or birds, and other times we will use magnifying glasses to look closer at the world around us. We plant seeds to observe their growth, roll down hills to discuss force and motion, and much more.

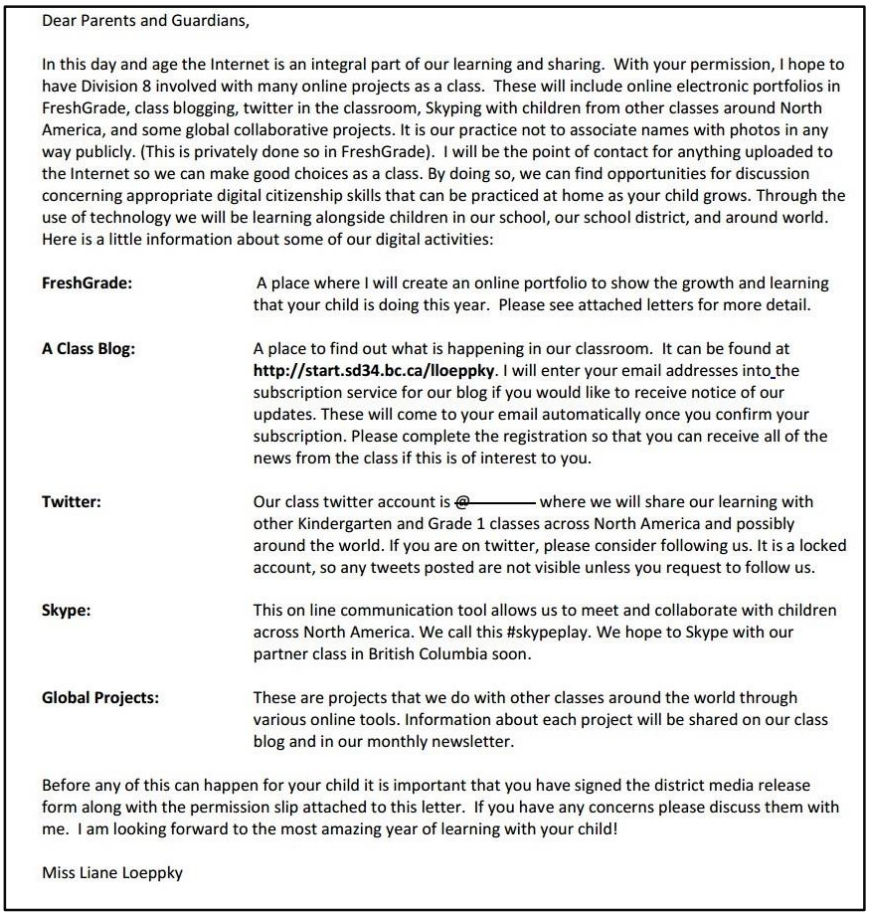
The students will have access to sticks and rocks during their outdoor times, and a part of my job is to teach students how to use these loose parts while respecting their classmates and community. The children often wish to bring these treasures home to share with you and their family. They may even ask for a shelf to house their collection.

We will be spending several afternoons a week involved in outdoor nature experiences. Your child may come home dirty from creating mud pies or a little damp from splashing in puddles. Please make sure your child has an extra set of clothing (including socks) at school for emergencies, and if possible, please send a pair of rubber boots that can stay at school for sudden rainy days. The boots will be sent home at the end of the school year, with any remaining emergency clothes.

Thank you for your support of our outdoor nature experiences. I look forward to sharing many of our discoveries with you over the year!

Figure 5. Parent information letter
http://media.wix.com/ugd/58f82f_f08e41c35b8647b9ab639a82aee562c5.pdf

The students in my classroom have been involved in social media projects for the past two years and, as several activities include technology components, I have also included a copy of the technology letter (Figure 6) for parents. It is important for teachers to get parental consent before sharing images online or before collaborating online with students from around North America. For example, when the class observes a local bird outside, they can tweet a photo or a message to their online community. This has the potential to become an interesting conversation about local wildlife between students from different areas of North America.



Dear Parents and Guardians,

In this day and age the Internet is an integral part of our learning and sharing. With your permission, I hope to have Division 8 involved with many online projects as a class. These will include online electronic portfolios in FreshGrade, class blogging, twitter in the classroom, Skyping with children from other classes around North America, and some global collaborative projects. It is our practice not to associate names with photos in any way publicly. (This is privately done so in FreshGrade). I will be the point of contact for anything uploaded to the Internet so we can make good choices as a class. By doing so, we can find opportunities for discussion concerning appropriate digital citizenship skills that can be practiced at home as your child grows. Through the use of technology we will be learning alongside children in our school, our school district, and around world. Here is a little information about some of our digital activities:

FreshGrade: A place where I will create an online portfolio to show the growth and learning that your child is doing this year. Please see attached letters for more detail.

A Class Blog: A place to find out what is happening in our classroom. It can be found at **http://start.sd34.bc.ca/lloeppky**. I will enter your email addresses into the subscription service for our blog if you would like to receive notice of our updates. These will come to your email automatically once you confirm your subscription. Please complete the registration so that you can receive all of the news from the class if this is of interest to you.

Twitter: Our class twitter account is @———— where we will share our learning with other Kindergarten and Grade 1 classes across North America and possibly around the world. If you are on twitter, please consider following us. It is a locked account, so any tweets posted are not visible unless you request to follow us.

Skype: This on line communication tool allows us to meet and collaborate with children across North America. We call this #skypeplay. We hope to Skype with our partner class in British Columbia soon.

Global Projects: These are projects that we do with other classes around the world through various online tools. Information about each project will be shared on our class blog and in our monthly newsletter.

Before any of this can happen for your child it is important that you have signed the district media release form along with the permission slip attached to this letter. If you have any concerns please discuss them with me. I am looking forward to the most amazing year of learning with your child!

Miss Liane Loeppky

Figure 6. Technology permission letter.
http://media.wix.com/ugd/58f82f_e13c77ea5d8d4ea8bd3463818bc04410.pdf

On the Blacktop. The urban school playground environment often has areas with blacktop as well some type of playing field. A blacktop play area provides a space with visible boundaries for students to explore while they practice responding to the attention cues that the teacher has established. Younger students often need activities that are scaffolded to practice listening skills, collaboration skills, and to become comfortable in outdoor classroom spaces. The On the Blacktop page (Figure 7) is where I provide a variety of activities for teachers to use and adapt with their students. These skills are practiced in smaller playing areas and the gradual release of teacher control occurs as students become more independent in their problem solving, communication, and listening.

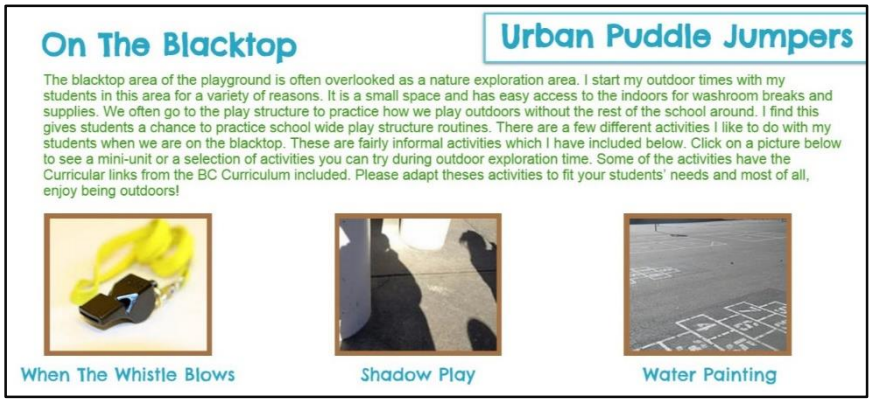


Figure 7. On the Blacktop.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!grassy-spaces/r5eqe

The activities created for this section of the website are for teachers who may be unsure of how to begin outdoor exploration with students. These are informal activities with curricular objectives from the 2015 B.C. K/1 curriculum documents (Figure 8, Figure 9, and Figure 10). The activities can be repeated with students several times when beginning outdoor explorations to allow younger students to become familiar with their surroundings.

When The Whistle Blows

BC Curricular Links (Kindergarten):

- Engage actively as listeners to develop understanding of self and community (ELA)
- Develop and demonstrate safety, fair play and leadership in physical activities (PHE)
- Develop and demonstrate respectful behaviour when participating in activities with others (PHE)
- Identify and describe feeling and worries (PHE)

BC Curricular Links (Grade 1)

- Engage actively as listeners to develop understanding of self and community (ELA)
- Develop and demonstrate safety, fair play and leadership in physical activities (PHE)
- Develop and demonstrate respectful behaviour when participating in activities with others (PHE)
- Identify and describe feeling and worries (PHE)

I do whistle practicing a lot with my students when we are back to school in September. I usually start this on the actual play structure in our blacktop area. We go over the rules in the classroom about what to do when the whistle blows. My rule for students is to "stop what you are doing and come see me". Sometimes we make it a "timed" game to see how quickly everyone can assemble together. Some of the kids also like it when I move around so they have to find where I have moved to. The children who are feeling apprehensive about the play structure often hang out with me for the first few outdoor visits, but usually by the third trip outside, they join in with others fairly quickly. Once all the students can respond to my whistle on the play structure, I open the space up to the entire blacktop area with some equipment like chalk, bubbles, balls and skipping ropes. We practice the whistle signal again until I have all the children responding in a timely manner. I do the same type of activity whenever we explore a new area. I need to know that the students will come in case of an emergency.

Figure 8. When the Whistle Blows.
*F*http://media.wix.com/ugd/58f82f_55cd3b5d3803493f96dc48f9c4f15825.pdf

Shadow Play

BC Curricular Links (Kindergarten):

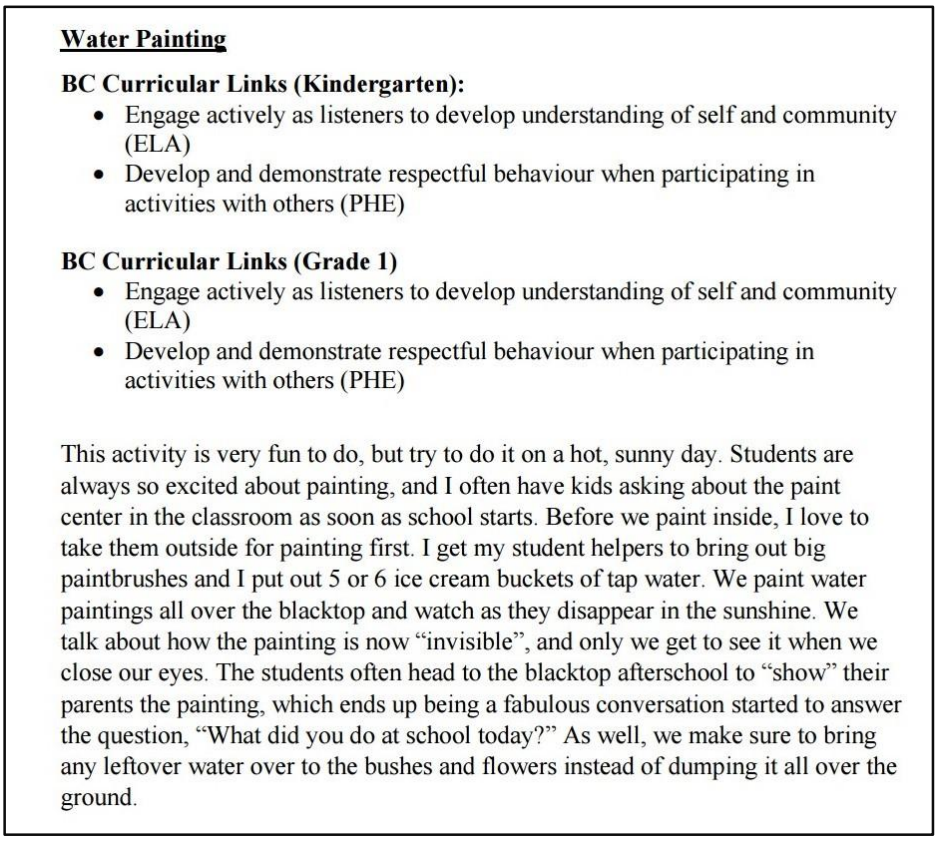
- Demonstrate curiosity and a sense of wonder about the world (Science)
- Discuss observations (Science)
- Sequence objects, images , and events, and distinguish between what has changed and what has stayed the same (Social Studies)
- Develop and demonstrate safety, fair play, and leadership in physical activities (PHE)

BC Curricular Links (Grade 1):

- Demonstrate curiosity and a sense of wonder about the world (Science)
- Compare observations with prediction through discussion (Science)
- Sequence objects, images , and events, and distinguish between what has changed and what has stayed the same (Social Studies)
- Develop and demonstrate safety, fair play, and leadership in physical activities (PHE)

As the name suggests, we go outside and make shadows! I use this activity with the whistle practice routine as there are no water buckets to run around. I do like to take sidewalk chalk outside and have the kids trace people's shadows. We will also trace our feet and return to the spots at different times during the day to see how our shadows change. Sometimes, I take large roll papers out and the children will trace their shadow shapes. I had students last year bring out some of our school iPads and photograph the shadows they like. We looked at the pictures on the SmartBoard and had fun talking about what we saw. Again, a sunny day is good for this activity, and I keep it on the blacktop so that the students can get drinks if it is hot.

Figure 9. Shadow Play
http://media.wix.com/ugd/58f82f_4948997a7deb467d8fd35b7cff353c6c.pdf



Water Painting

BC Curricular Links (Kindergarten):

- Engage actively as listeners to develop understanding of self and community (ELA)
- Develop and demonstrate respectful behaviour when participating in activities with others (PHE)

BC Curricular Links (Grade 1)

- Engage actively as listeners to develop understanding of self and community (ELA)
- Develop and demonstrate respectful behaviour when participating in activities with others (PHE)

This activity is very fun to do, but try to do it on a hot, sunny day. Students are always so excited about painting, and I often have kids asking about the paint center in the classroom as soon as school starts. Before we paint inside, I love to take them outside for painting first. I get my student helpers to bring out big paintbrushes and I put out 5 or 6 ice cream buckets of tap water. We paint water paintings all over the blacktop and watch as they disappear in the sunshine. We talk about how the painting is now "invisible", and only we get to see it when we close our eyes. The students often head to the blacktop afterschool to "show" their parents the painting, which ends up being a fabulous conversation started to answer the question, "What did you do at school today?" As well, we make sure to bring any leftover water over to the bushes and flowers instead of dumping it all over the ground.

Figure 10. Water Painting.
http://media.wix.com/ugd/58f82f_9983325664c24004a8da8507ecd34c5a.pdf

Grassy Spaces. The next subpage under the First Steps section is titled Grassy Spaces (Figure 11). The activities in this section support teachers in moving students from a confined area like the blacktop to a larger area such as a sports field or park environment. Some of the activities have curricular links to assist teachers in assessment and observations, but not all of them have explicit curricular links. This choice highlights the belief that teachers don't need to be bound to explicit curriculum at each moment in

the teaching day. The idea of allowing students to develop their own interests and emergent curriculum requires flexibility in teacher planning.

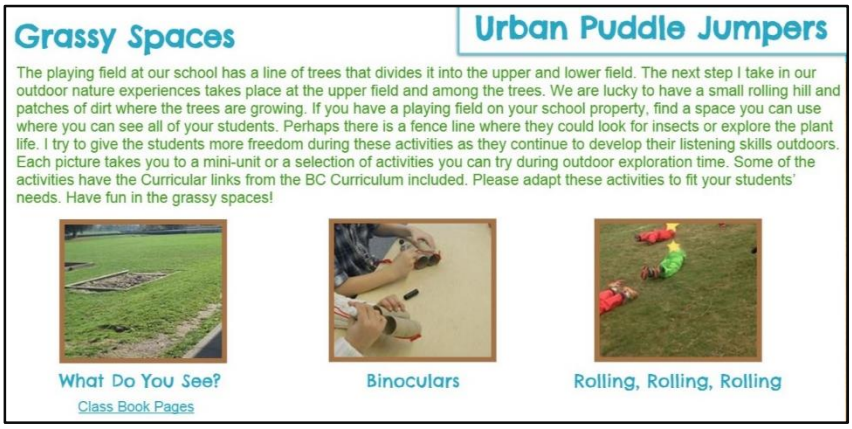


Figure 11. Grassy Spaces. http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!grassy-spaces/r5eqe

The following lesson, Binoculars, (Figure 12), is an example of a combined indoor and outdoor exploration with no explicit curriculum links attached to it.

I try to link this activity in with our study of the letter of the B. I bring binoculars into the classroom for the students to explore with a couple of days before we talk about making our own.

Activity (Inside and Outside)	Time	Teacher	Learner	Observations/Assessment
Engage (Inside)	10 mins	Discuss what the binoculars did to help us see. Ask students to reflect on how they used the binoculars. How could we make our own binoculars to explore outside?	Recall past experiences Engage in group conversation Use equipment in a safe manner	Proper usage of binoculars Active listening Conversation participation
Interact (Inside)	15 mins	Hand out "binoculars" (2 toilet paper rolls hot glue gunned together, piece of string attached so kids can wear them) Students can decorate them with colouring materials in the room.	Decorating binoculars Using colouring materials appropriately	Engaged in creating their own binoculars
Explore	15-20 mins.	Head outside with the "binoculars". Make sure you do this on a dry day or else your "binoculars" melt in the rain. We often start with looking as a group and searching for things in the sky or in the trees. This helps to get their imaginations going for independent "looking". I let the students have free exploration time around the field and the trees and most of them choose to hunt with binoculars.	Active listening Using imaginations Conversational and observational language	Following outdoor expectations Engaged in imaginative process Conversing with peers
Reflect (Inside or Outside)	10 mins.	Discuss with students what they saw with their binoculars. If you have clipboards for recording outside, students could use their "binoculars" and draw or write what they observed or imagined in their Science or Writing Journals.	Sharing their "real" and "imaginary" observations though conversation, drawing or writing Listening to ideas of others	Recording observations through drawing or writing Engaged in conversation Active listening in conversation

I usually send the binoculars home the same day I do this activity with the students as they are excited to show their parents what they have created. I have left out "spare" undecorated pairs in the past for those students who want to create another pair.

Figure 12. Binoculars.
http://media.wix.com/ugd/58f82f_159182e3fa0140608b1d02cc09263490.pdf

This lesson uses the form of engaging the students, allowing them to interact with material or knowledge, exploring and reflecting on experience. Students create their own pair of binoculars and bring them outside to search for far away objects, while listening for teacher cues and signals in a larger exploration space.

Rocks, Sticks, and Dirt. An issue that is often brought up by teachers, parents and administrators when I discuss outdoor exploration and students, concerns student safety during exploration with sticks, rocks, and mud. I have had conversations with administrators, parents, and fellow teachers over possible safety concerns and implications of students throwing rocks and using sticks as weapons. Another concern I

have encountered with outdoor exploration is the muddy appearance of the students. The 2015 ParticipACTION Report Card on Physical Activity for Children and Youth states that risky play

> …means giving children the freedom to decide how high to climb, to explore the woods, get dirty, play hide ‘n seek, wander in their neighbourhoods, balance, tumble and rough-house, especially outdoors, so they can be active, build confidence, autonomy and resilience, develop skills, solve problems and learn their own limits. It’s letting kids be kids—healthier, more active kids. (p. 9)

In this section of the website (Figure 13), I included lessons, activities, and a link to children’s books to guide teacher experiences with some “risky play” experiences for their class.

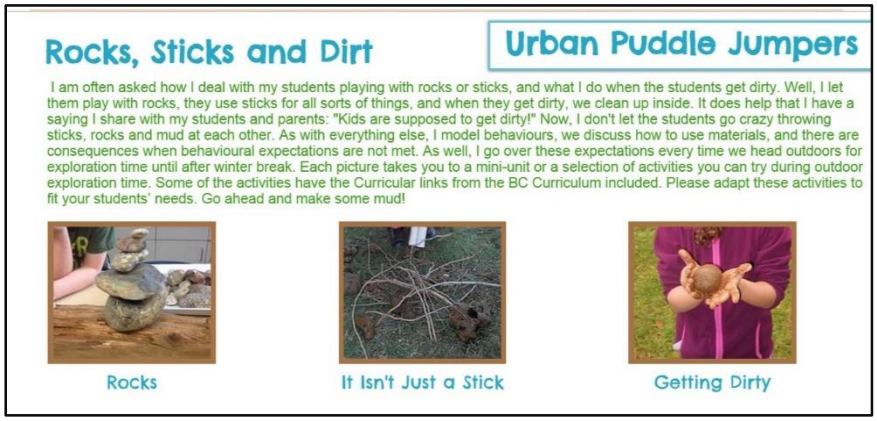


Figure 13. Rocks, Sticks, and Dirt. http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!rocks--sticks-and-dirt/y5bb3

This subpage of the First Steps section includes formal lessons plans with curricular links for working with rocks (Figure 14), some suggested activities for stick play, (Figure 15) and some ways to allow students to get into the mud and get dirty (Figure 16).

Rocks



Activity 1 (Inside and Outside)	**Time**	**Teacher**	**Learner**	**Observation/Assessment**
Engage (Inside)	10 mins	Read the story *Everybody Needs a Rock*. Discuss the rules in the book for hunting rocks as the story progresses.	Recall 1 or 2 of the rules for finding a rock	Recall of story information Active listening
Interact (Inside and Outside)	15 mins	Have students brainstorm where we could look for rocks safely in the schoolyard. Take a walk around after the brainstorming session and ask students if they can identify if it is a safe place or should we keep looking.	Brainstorming ideas of where to look for rocks at school Active listening while outdoors examining areas	Following safety instructions while walking around the school yard
Explore (Outside)	15 mins	Once a spot has been selected that meets teacher and student criteria, remind students that they are searching for that 1 special rock. (I take a few out in my pocket in case someone doesn't find a great one).	Recall 1 or 2 of the rules for finding a rock Searching for and exploring the rock they found	Recall of story information Safe searching of schoolyard Staying within the predetermined boundaries Oral communication about their treasure

Figure 14. Sample of Rocks Lesson.
http://media.wix.com/ugd/58f82f_af15bf59d47b4d70afbc90c4d3117fce.pdf

It Isn't Just a Stick

I don't do any formal lessons with students regarding the sticks we find on our grassy field or in the playground. I do scaffold how we can use sticks during outdoor and indoor explorations and have included that below.

1. **Loose Parts**
   I like to have smaller sticks in the classroom as a part of our loose parts display. I have the students collect them for me during one of our early fall outdoor explorations. While inside, I tell to them we are going on a stick hunt, and that we will be collecting these sticks to bring inside. We discuss how long the sticks should be and I try to give them a comparative like their hand for the length. I have wicker baskets that we take outside, and I show them that the stick should fit in the basket. During this first stick exploration, I find that kids are focussed on finding them, and I don't have the "stick play" of swords and guns during this time. We look outside for about 10 minutes, and then do some rolling down the hill or free play. I find that some students will continue to look for sticks as well.

2. **Not a Stick**
   I read or reread the story, *Not a Stick* by Antoinette Portis. This story does have swords in it, and the students usually ask if they can play with the sticks as swords or lightsabers. This is where we come up, collectively, with a list of stick uses. We create a chart paper list or a Popplet on the iPad of how we can use found sticks

Figure 15. Sample of It Isn't Just a Stick.
http://media.wix.com/ugd/58f82f_590984bf6e094b9889e6043c79dad099.pdf

Getting Dirty

I often have teachers and parents ask about students getting "dirty" with our outdoor exploration times. My philosophy on dirt, is very simple: kids get dirty. I don't condone rolling around in a mud puddle, but I love to see the students digging, playing in or working with dirt or mud. There are so many fascinating creatures to be found in the dirt, and digging can be a very stress relieving activity. I do not force students to play in the dirt, but I allow them the freedom to choose. Parents have expressed concerns about dirty clothing in the past, but I always remind them that outdoor exploration and working in the natural world are a part of my early learning environment. I do request a clean set of clothes for school in case of a major mud catastrophe, and I send home reminders on our class calendar of when we are heading outdoors so that students dress in "play" clothes. Some parents have told their students not to get dirty when we go outside, and while I disagree with that limitation, I always leave the choice up to the student. My class was gifted a set of rain suits by our administrator (the link is on the Materials page) in 2014, and the freedom to get wet and dirty has opened up the exploration opportunities for my students. I have included a few "dirt activities" that I use with my students below. Adapt them as you need for your students and, as always, enjoy!

Figure 16. Sample from Getting Dirty.
http://media.wix.com/ugd/58f82f_bfc107535fd14d96802f886c1498537d.pdf

Adding iPads. The page titled Adding iPads (Figure 17) offers activities to do with students when the iPads are introduced to the classroom. Our school is fortunate to have a class set of these devices to be signed out by classroom teachers. Every year, I have students who have used these devices at home as well as students who have rarely touched one. The students use the iPads mainly for photography, as the zoom feature allows students to investigate the natural world closely. Photographs and videos are often used to create learning artifacts like online collages, class books, and slideshows, using tools such as PicCollage, TinyTap, and Explain Everything. I like to introduce the iPads and do some practice with them in the classroom and school, before taking them outside in the rain and dirt. The first lesson on this page, Get the iPads In Their Hands, reviews how I introduce the proper handling of the devices, what the different buttons mean, and provides an introduction to photography and video recording (Figure 18).

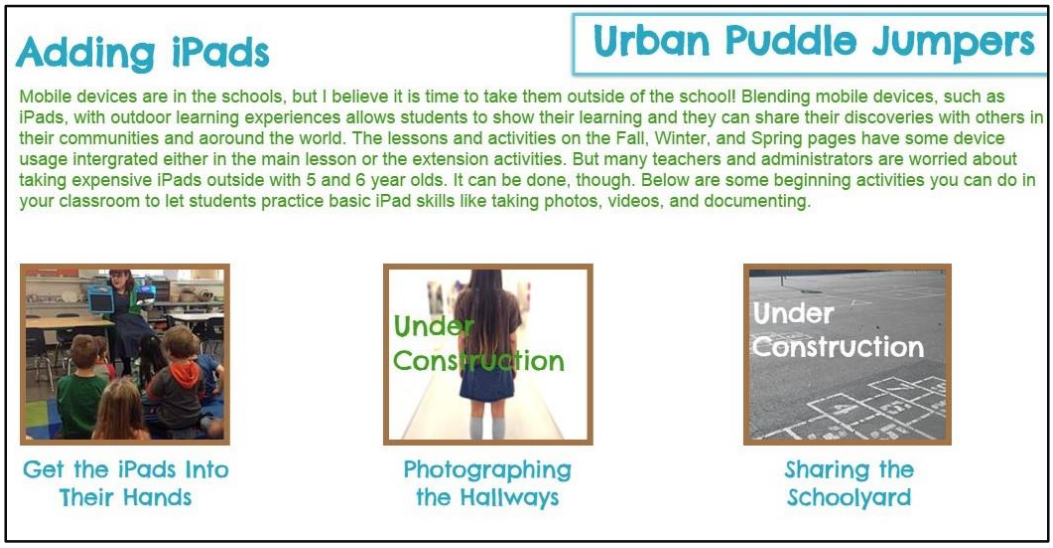
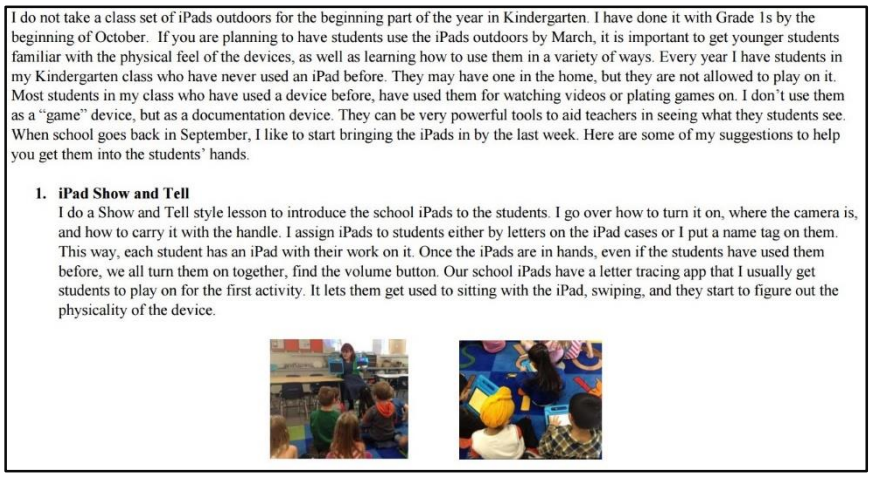


Figure 17. Adding iPads.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!adding-ipads/z5cnb



I do not take a class set of iPads outdoors for the beginning part of the year in Kindergarten. I have done it with Grade 1s by the beginning of October. If you are planning to have students use the iPads outdoors by March, it is important to get younger students familiar with the physical feel of the devices, as well as learning how to use them in a variety of ways. Every year I have students in my Kindergarten class who have never used an iPad before. They may have one in the home, but they are not allowed to play on it. Most students in my class who have used a device before, have used them for watching videos or plating games on. I don't use them as a "game" device, but as a documentation device. They can be very powerful tools to aid teachers in seeing what they students see. When school goes back in September, I like to start bringing the iPads in by the last week. Here are some of my suggestions to help you get them into the students' hands.

1. **iPad Show and Tell**
   I do a Show and Tell style lesson to introduce the school iPads to the students. I go over how to turn it on, where the camera is, and how to carry it with the handle. I assign iPads to students either by letters on the iPad cases or I put a name tag on them. This way, each student has an iPad with their work on it. Once the iPads are in hands, even if the students have used them before, we all turn them on together, find the volume button. Our school iPads have a letter tracing app that I usually get students to play on for the first activity. It lets them get used to sitting with the iPad, swiping, and they start to figure out the physicality of the device.

Figure 18. Introducing iPads to Kindergarten.
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Season Sections

Three of the main pages on Urban Puddle Jumpers are Fall, Winter, and Spring. As school is in session for the majority of B.C. teachers from September to June, I felt that separating themes, activities, and ideas by seasons made organizational sense. As this website is an ongoing project, I plan to have a minimum of three themes for outdoor exploration with some indoor crossover for each season.

Fall. The Fall section of the website includes a unit of study on colours of autumn, planting for the spring, and how animals get ready for winter (Figure 19). Images on the Fall page link to the activities for each theme, Daffodils and Pumpkins, Autumn Colours, and Getting Ready for Winter.

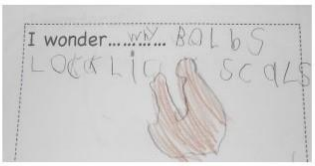
Figure 19. Fall Section.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!fall/c8hd

Daffodils and Pumpkins. The B.C. K/1 Science curriculum has a focus on the characteristics of, needs of, and classification of living things in the local environment. A particular focus in the content areas of the curriculum is on plant life. Spring is often the time when classes investigate seeds and germinate sunflowers, beans and more, but I prefer to include pumpkin and daffodil planting in the fall so that students can chart and explore the complete growth cycle of these plants while in my class. I created three lesson plans (Figure 20) for teachers to adapt as they need, while looking at bulbs and pumpkins in their classrooms, as well as investigating living and non-living things in our local environment.

Figure 20. Daffodils and Pumpkins Page.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!daffodils-and-pumpkins/r7dkq

These three lessons are conducted in both indoor and outdoor spaces, as I continue to take students outdoors to explore the environment in unstructured, open learning times. The lesson "What Is It?" involves students guessing a mystery object in a bag, investigating bulbs through magnifiers and iPads, and documenting their "wonder" observations (Figure 21, Figure 22).

What Is It?



Grade Level: Kindergarten-Grade 1

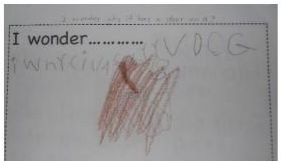
Materials:
Mystery Bag (a cloth drawstring bag)
"I Wonder" page
Daffodil bulb for each student plus extras
Collection on bulbs (daffodil, tulip, crocus, paper white, garlic)
Magnifying glasses

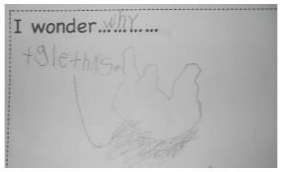
Lesson 1 (inside)	Time	Teacher	Learner	Observations/Assessments
Engage	10 min	Mystery Bag: 3-4 different types of bulbs in a cloth bag. Model how to use the senses and guess what is in the bag: feel, smell, sound, but they cannot open the bag and look inside. Record predictions on a chart, and tally repeat guesses. After all students have predicted, reveal what is in the bag (I usually use a tulip, daffy, crocus, and garlic bulb)	Uses senses to predict what is in the bag Listens to predictions of others	Active listening Appropriate predictions Descriptive language
Interact	15 min	Pass the bulbs around the circle and listen to observations. Model "I wonder" statements as they get passed around. If a	Use senses to observe the bulb. Say an "I wonder" statement about the bulb.	Uses observational language Handles materials safely Active listening

Figure 21. What Is It?
http://media.wix.com/ugd/58f82f_c0d34ece440147858a03f98d69cbf0ec.pdf

		document camera is available, students could order them by size.	Ordering by size	
Explore	15 min	Give everyone a bulb to investigate and each group gets a cut bulb to look at. Remind them that they need to go back in the box when done and not to pull off the "paper" on the bulb. Investigate bulb and cross section with magnifiers.	Use senses to observe the bulb. Discuss observations with table groups. Illustrate their wonder statement. Share "I Wonder" illustration and sentence with a friend when done.	Illustrates wonder statement. (Teacher can scribe while circulating) Shares "I Wonder" sentence with friends.
Reflect	10 min	Share "I Wonder" statements with friends, and with the group. Ask students for ideas on where we should plant the bulbs. Inform them of the date for planting	Share their work with friends and the group. Brainstorm ideas for planting areas.	Sharing statements with others. Listening to the ideas of others Offering realistic suggestions for planting areas.

Extend:
As a Science provocation, I would leave the cross-sectioned daffodil bulbs and the other bulbs out for the students to explore at the science table. Some tools to put with the bulbs for investigation are paper, pencil crayons, magnifying glasses, a balance scale, and plant books. Students can explore the bulbs over the next few days. If possible, have an iPad or iPod available for photographing and labelling as well.





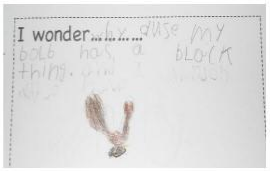


Figure 22. What Is It? Page 2.
http://media.wix.com/ugd/58f82f_c0d34ece440147858a03f98d69cbf0ec.pdf

The lesson "Is It Alive?" allows students to recall and sort the needs of living things, and identify what is living and non-living. During this lesson, the iPads are used to photograph observations, record ideas and create learning documents for students to share with classmates and our twitter community (Figure 23, Figure 24).

Is It Alive?

Grade Level: Kindergarten-Grade 1

Materials:
Houseplant
Science Journals
Image Cards (Needs of living things)
Daffodil Bulbs
iPads or cameras

Lesson	Time	Teacher	Learners	Observation/Assessment
Engage	10 Mins	Ask what students need in order to grow up healthy. What things have they needed and done to grow to be in this grade. Show a houseplant to the students. What did it need to grow like that?	Share traits of healthy living Asses prior knowledge about what plants need	Level of engagement in conversation Sharing knowledge respectfully Assess prior knowledge

Figure 23. Is It Alive? Page 1.
http://media.wix.com/ugd/58f82f_0fc3877d7d084c6d9d934729f0f9ed06.pdf

Explore	15 mins	Use iPad cameras to explore 2 areas of the school (blacktop, grass area, park are some ideas) and photograph 5 living things and 5 non-living things. (watch that kids don't just take pictures of their friends for living things) If you do not have access to these, students could also use clipboards/Science Journals to draw their findings.	Identify living and non-living things on the schoolyard Follow outdoor expectations Document findings of living and non-living things	Use documentation tools appropriately Active outdoor listening
Reflect	15 Mins	Review what living things children found on the school grounds. How did they know it was living? What did it need to grow? Students record observations in their science journals.	Engage in sharing out discoveries Recall characteristics of living and non-living things Record findings in journals	Active sharing listening Engages in conversation while being on topic Illustrates, writes or photographs evidence of living and non-living things
Extend		Using pic collage, have students create living and non-living collages to print out and save in their science journals. Brainstorm ideas for places to plant and write a letter to the principal asking permission.	Investigating use of pic collage for documenting learning on iPads Letter writing to an authentic audience	Use of Pic Collage and peer helping Introduction of form for letter writing

Figure 24. Is It Alive? Page 2.
http://media.wix.com/ugd/58f82f_0fc3877d7d084c6d9d934729f0f9ed06.pdf

In “Collaborative Planting” students are encouraged to problem solve how to grow pumpkin seeds or bulbs using a limited amount of supplies. This lesson has students practicing their collaboration skills and sharing their problem-solving plan with others, either through oral presentation or video recording (Figure 25, Figure 26).

Collaborative Growing

Grade Level: Kindergarten-Grade 1

Materials:

(Forcing Bulbs)	(Pumpkins)	Other
Tall glass vase Clean marbles, rocks or pebbles Bulbs Water	Small pumpkin Soil Small knife to remove “lid” (adult does this) Plate to rest the pumpkin on (not paper as it will get mushy)	iPad for photographing growth Ruler to measure growth Charts to record growth Science Journals

I do this lesson as 2 whole group sessions (1 for the bulbs, and 1 for the pumpkin) with my Kindergartens as they are not overly collaborative by October. Grade 1 and 2 classes may be able to work in table groups.

Lesson	Time	Teacher	Learners	Observation/Assessment
Engage		Review the pocket chart picture sorting activity of what plants and humans need to grow. Ask students what will happen if something is not provided to the plant. Have them predict what would happen without water (take the water picture/word away), without dirt (take the picture away), etc.	Recall information from previous science experience Predict what will happen if plant is not provided with 1 “ingredient” for growth	Recall of information Able to make a prediction Understands what a prediction is

Figure 25. Collaborative Planting Page 1.
http://media.wix.com/ugd/58f82f_5942793d53d940f9bbe7cb1af909cdd5.pdf

Interact		Show students the materials you have brought in. Each table has some supplies. In their groups, have them discuss what they think they should do with the supplies.	Active group listening Discussion with table members about supplies and how to create a growing environment	Focussed discussion Problem solving
Explore		Have students come up with a procedural plan but DO NOT DO IT. You could also use procedure pictures or sentences for them to put in order. With adult assistance or during centers time, have each group work with you to set up the experiments. Ask them what they think will happen to the plant.	Creating a procedural plan for setting up a growing environment OR putting the procedural pictures/sentences in order. Collaborative discussion Prediction of growing outcome Collaborative creation of environment	Working as a group Problem solving Predicting outcome
Reflect		Students can record what they think will happen in their Science journals or you could record their ideas on the class iPad to input into a book on the experience. If you want to create a book, have a photographer for each group to record the experiment set up.	Recording prediction into Science journal for planting outcome Documenting process with cameras	Documenting prediction through drawing, writing or oral language
Extend		Chart growth daily of the plants and record observations. As the plants sprout (or not) over a couple of weeks, come back to the conversations about why something grew or why not. Students can record observations, orally or written, and a class or small group book or learning panel can be created from this.	Recording observations daily to chart growth over time. Measure the growth of indoor plants Document process through photos, illustrations, or writing	Measuring growth on charts over time Recording observations on plant

Figure 26. Collaborative Planting Page 2.
http://media.wix.com/ugd/58f82f_5942793d53d940f9bbe7cb1af909cdd5.pdf

Winter and Spring. As I continue to develop the outdoor exploration themes and units that my class is involved in for the remainder of the school year, I will add them to Urban Puddle Jumpers. Planned winter themes include explorations into winter weather locally, nationally, and internationally through twitter conversations and Padlet collaborations, investigating seasonal changes in our immediate environment, and exploring the rain or snow (Figure 27).

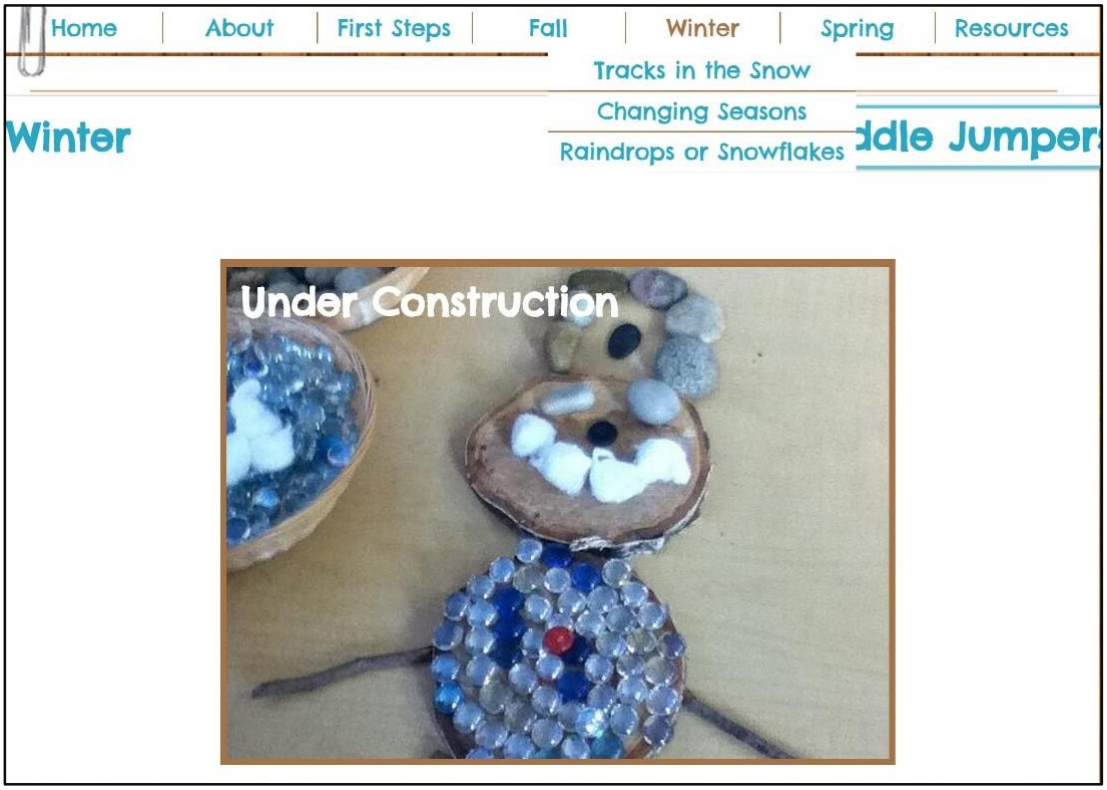


Figure 27. Winter Page.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!winter/t69m5

Spring themes or units will include investigating the mathematical concept of capacity, studying worms in our gardens, and completing the growth charts for the bulbs and pumpkins that were planted in the fall (Figure 28).

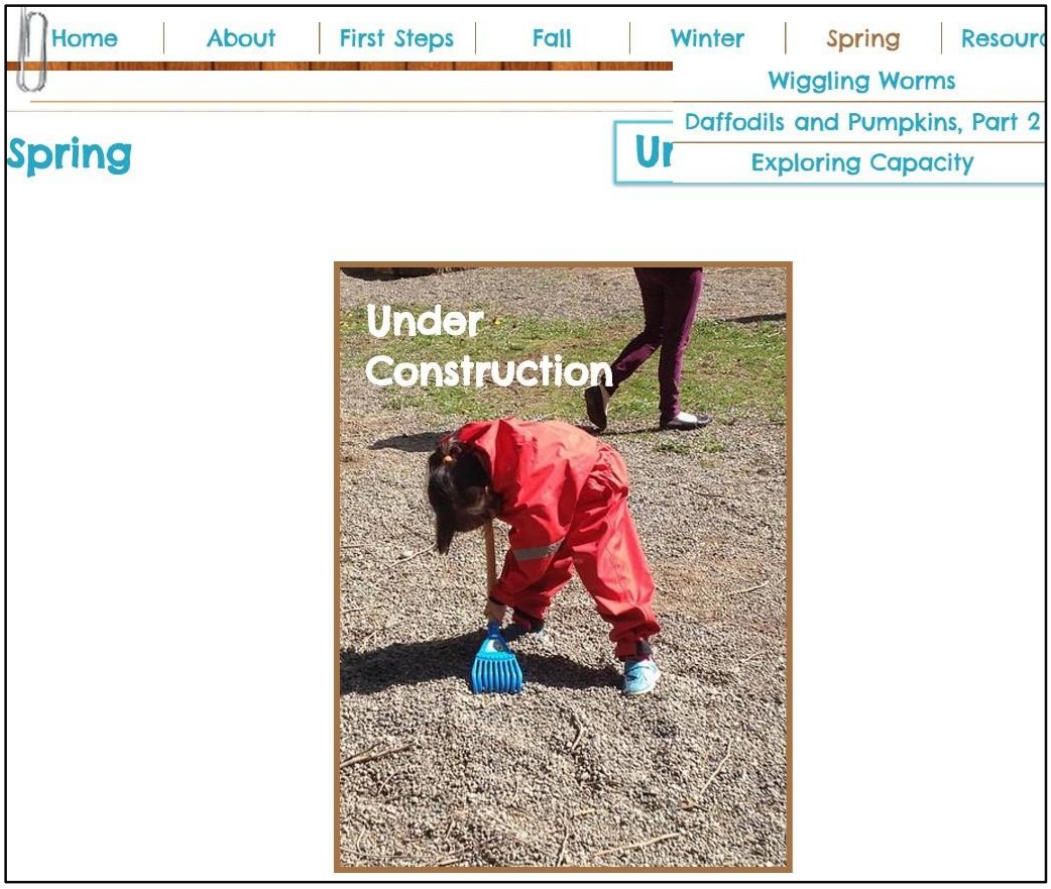


Figure 28. Spring Page.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!spring/d2h49

Resource Pages

The Resource page on Urban Puddle Jumpers is divided into four subpages, Children's Books, Teacher Inspiration, Materials, and Research Binder (Figure 29). Each of these subpages contains links to literature, blogs, twitter chats, materials, and B.C. curriculum guides as well as other relevant research.

Figure 29. Main Resource Page.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!resources/rb7zb

Children's Books. The large number of children's books I use with outdoor themes was too much to curate on one page, so I created separate pages for each main page on the website (Figure 30). The image associated with each webpage contains a link to the page with the literary collection. Each of these pages has children's literature separated by thematic unit (Figure 31), and each story image links to a webpage where the book can be purchased.

Figure 30. Children's Books.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!children-s-books/cilmt

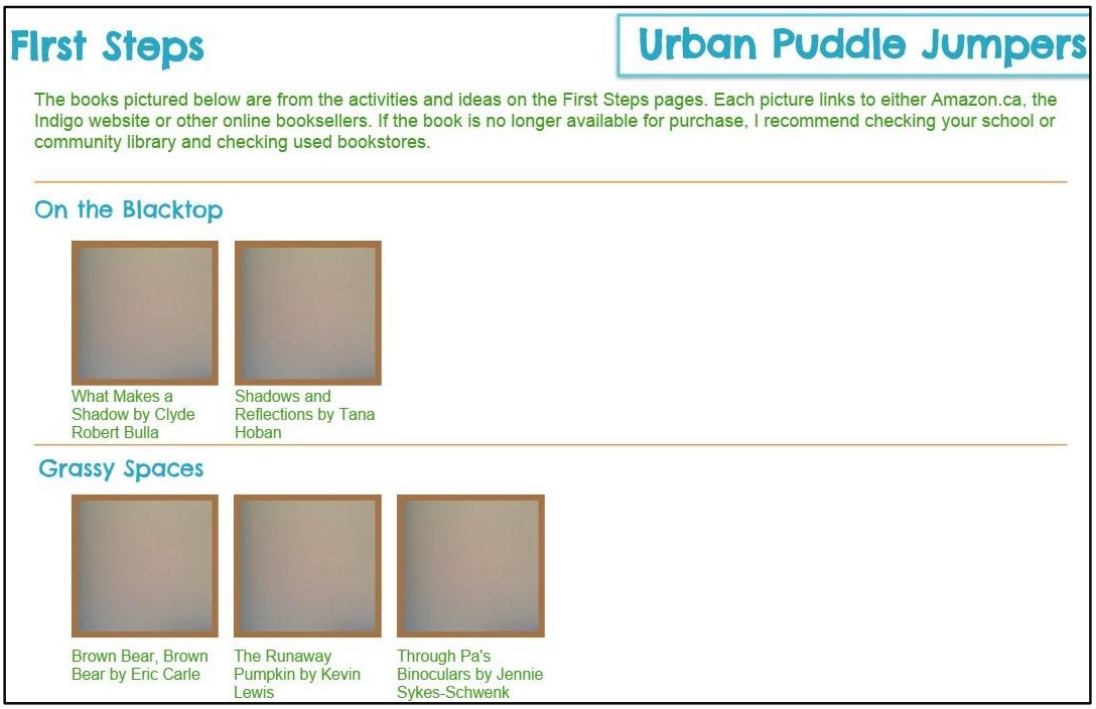


Figure 31. First Steps Books.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!blank/l0jk8

Teacher Inspiration. The Teacher Inspiration page (Figure 32) contains teacher resource books, blogs, and twitter chats I have found inspirational as I discover outdoor learning with early learners. Images of the resource books are linked to sites where they can be purchased. Teacher blogs that I have followed are also included on this page through link buttons (Figure 32). The twitter chats where I have found inspiration and guidance on this pedagogical journey are also located on link buttons. I included the chat times for those interested, and the link takes the reader to archived chats.

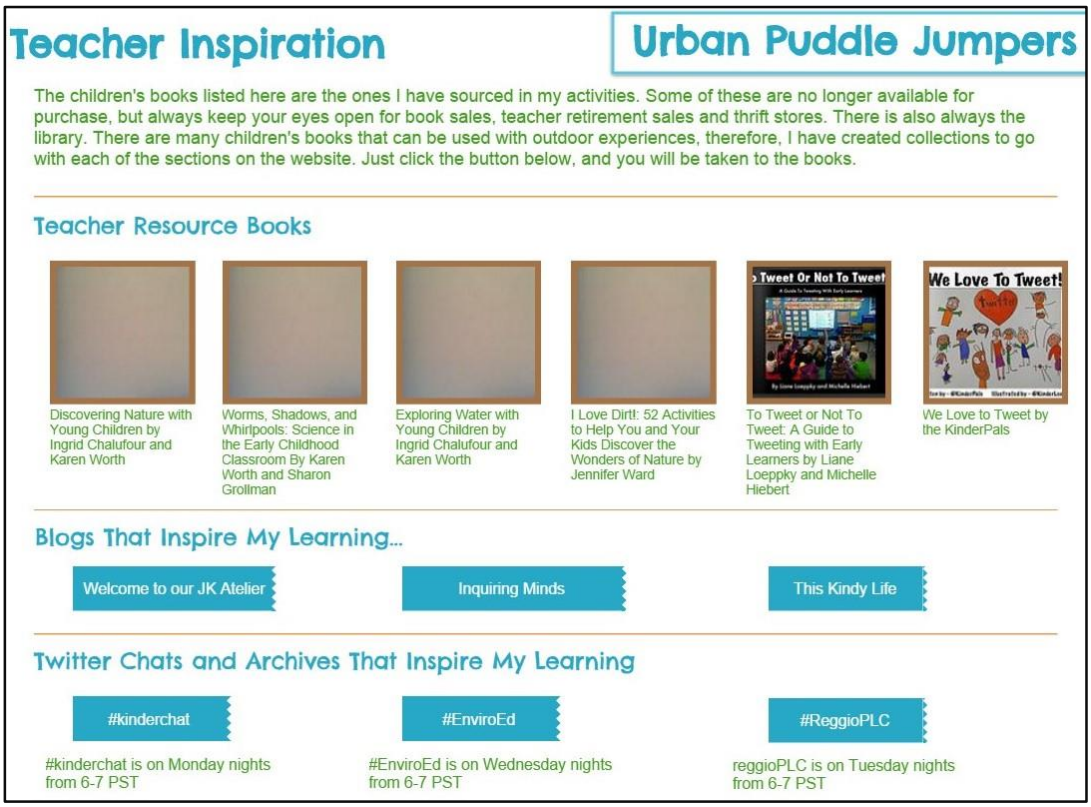


Figure 32. Teacher Inspiration Page.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!teacher-inspiration/o0py4

Materials. The Materials Page (Figure 33) is a small sample of supplies I use for outdoor explorations and learning with students. I chose to include a sample of objects, which I referenced in the activities and lessons. As with the Children's Books and Teacher Inspiration pages, the images on this page have a link which goes to a website where one can purchase items.

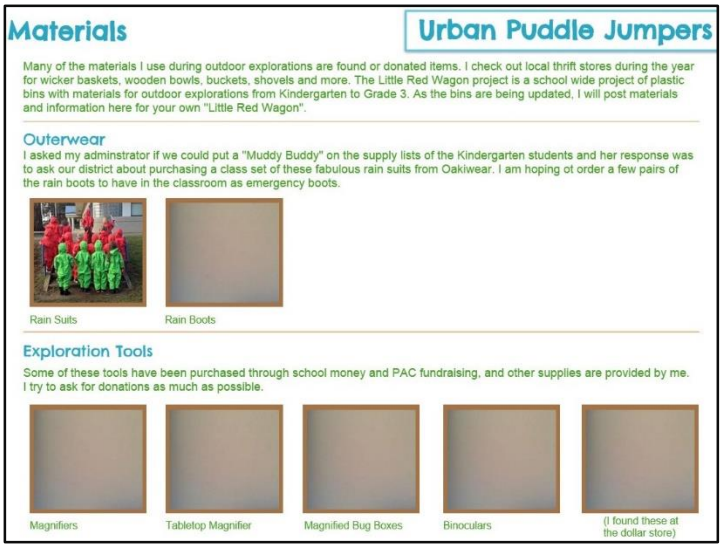


Figure 33. Materials Page.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!materials/cg5gp

Research Binder. I included a page where teachers could find research, articles, and curriculum to help defend the practice of play while indoors and out. The Research Binder page (Figure 34) is where curriculum links to the B.C. curriculum website and the Full Day Kindergarten program guides from the B.C. Ministry of Education are located. I have included the link to Alberta's curriculum documents and the Ontario Full Day Kindergarten Program Guide for teachers who may live in those provinces. As I move ahead, I will continue to add links to the provincial curriculums across Canada, in hopes that teachers beyond B.C. will access the site. I will post links, as I find them, to articles

and research on topics such as the benefits of outdoor play, inquiry based outdoor learning, and mobile technology use in early childhood classrooms.

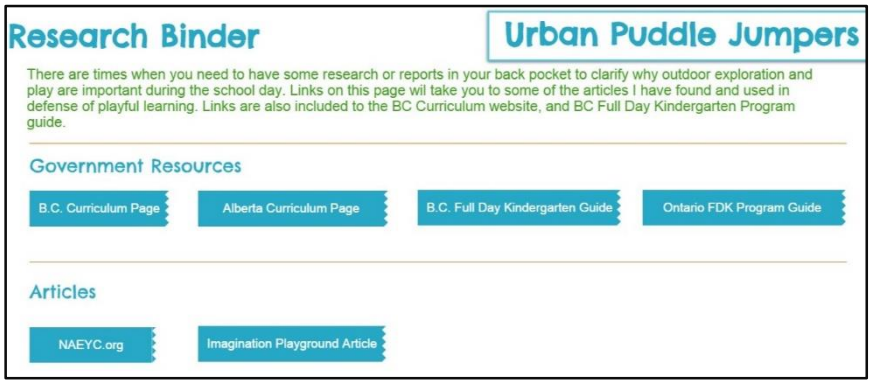


Figure 34. Research Binder.
http://urbanpuddlejumpers.wix.com/urbanpuddlejumpers#!research-binder/quaqi

Future Plans for Urban Puddle Jumpers

The website, Urban Puddle Jumpers, continues to be updated with new subpages, activities, and lessons focussing on outdoor experiential, exploration learning. As I engage in conversations with other primary level teachers, the interest in outdoor learning opportunities is growing due, in part, to research and reports being publicized which illustrate the benefits of active, engaged learners. The importance of incorporating inquiry, emergent curriculum, and play, both indoors and outdoors, is a focus of discussion and interest among many teachers.

The increased interest in play-based, inquiry driven, and emergent learning environments has inspired me to continue documenting the processes, learning, and ideas I use with the students in my class. I plan to expand the content of Urban Puddle Jumpers to include ideas for indoor learning opportunities that showcase how play can be used to facilitate academic learning, how student interest can drive curriculum, and how mobile technology can be used by students to document their learning.

Chapter 4: Reflecting Back and Looking Forward

Project Summary

Urban Puddle Jumpers is the website resource I created for Kindergarten and grade one teachers who are interested in bringing outdoor experiential learning opportunities into their teaching and practice. Urban Puddle Jumpers includes a page on management tips, parent letters, and suggested ways to begin the process of outdoor exploration with young children. The activities found on the First Steps page are broken into subsections of On the Blacktop, Grassy Spaces, and Rocks, Sticks, and Mud. Activities found on these pages are scaffolded to allow young children the opportunity to become comfortable in the outdoor classroom while practicing active listening and response to teacher signals and instructions. The page Adding iPads includes the routines and activities I undertake with students when introducing them to the school's mobile devices.

The website also includes sections for each season that most B.C. schools are in session. These sections, Fall, Winter, and Spring, include mini-themes, activities, and lessons that link B.C. K-1 curriculum to outdoor learning experiences. The thematic unit on planting in the fall consists of three lessons. These lessons focus on students using their senses to observe a variety of bulbs, searching for and photographing living and non-living objects in their outdoor environment, and working in a group to create a mini growing environment for pumpkins, daffodils or other plants that grow from bulbs. These will continue to be updated and added to as I further develop the website.

Resources are included for teachers on the website, and are divided into the sections, Children's Books, Teacher Inspiration, Materials, and Research Binder. The

Children's Books, Materials, and Teacher Inspiration sections include links to online sites where resources can be purchased. The Teacher Inspiration page also includes links to blogs and twitter chats that have inspired me and helped me create a personal learning network. The B.C. curriculum for all grades is linked on the Research Binder page, as well as the B.C. Full Day Kindergarten Guide (2010). This space is for articles, research, and reports that support the inclusion of outdoor learning and play in the school day.

With many teacher resources and websites available on a variety of topics, I hope Urban Puddle Jumpers will inspire teachers to take their students outside and explore the learning opportunities available. My goal is to reach a small group of interested teachers, and provide them with ideas, research, and resources to support them as they start the journey outdoors and into the realm of emergent learning. Taking the first steps on a new path can be very scary, and I hope this website will alleviate some teacher worries and fears related to outdoor experiential, exploration learning.

Evolving Professional Beliefs

My intention at the beginning of this Master's of Education program was to show that technology in the hands of young children was not detrimental to their development. Throughout this program, however, that has changed. My initial focus on technology enhancing the learning of younger students shifted to how technology can be used as a creation or self-documentation tool while exploring outdoors. There are benefits to technology being used with young students, but I discovered, through research reading, discussions, and observations, that technology, specifically mobile devices like iPads, are another tool in the classroom, much like a whiteboard or a paint easel. There is much that can be done with an iPad or tablet device in the early primary grades, but I have

realized that unless the technology in my classroom is facilitating engagement, collaboration, and participation through play and inquiry, it does not belong in the classroom environment I am trying to create. Technology will still be available in my classroom, but its purpose has changed from that of an independent activity, which may mimic a worksheet, into a collaborative tool. I still believe that technology is not detrimental to the development of young children, as long as it is being used and monitored in appropriate ways.

The technology focus of this program, inadvertently, caused a shift in my professional thinking from an interest in iPad usage in classrooms to a complete change in my teaching practice. My reintroduction to Dewey's writings had a profound impact on how I viewed the classroom environment, and the child within it. Although I had adopted some aspects of the Reggio Emilia approach, I had not fully embraced the idea of a student-centered classroom or the idea of emergent curriculum. As well, I had explored some activities in outdoor learning, but the pedagogical readings I did during the course of this program, provided me with the courage to truly embrace the outdoor classroom. I have discovered, through the course of this program, the constructivist approach to teaching and learning, which has reignited my passion to leave worksheets, cut and paste crafts, and cookie cutter learning behind for a more engaging, creative, and student focused class environment. I now have the research to defend the practices I believe in, and I am able to continue exploring the idea of playful inquiry with young students, both indoors and outdoors.

The project for the Master's of Education program allowed me to collect my ideas and activities from the previous two years of teaching. It not only provided me

with the opportunity to build a collection of my ideas and activities, but it granted me a chance to reflect on my own journey into the outdoors with students. Taking those first trips outside was often nerve wracking, and building the content for the website provided me with an opportunity to share what I had learned during those experiences. It has provided me with a place to plan for future experiences as the year progresses. The project has, however, also shown me areas in early childhood education where I am lacking in knowledge and background. Assessing play based learning continues be a focus for me as I move forward, as well as continuing to read about and develop inquiry in the primary classroom.

Facing Forward: Impacting My Professional Career

I believe that the experience of working in this program has already affected my professional career. The confidence I have in my pedagogical beliefs has made me a stronger advocate for play and outdoor exploration within my school and my personal learning network. I see fellow teachers in the school building trying different tools on the iPads based on conversations we have had, and I see them taking their students outside, not just for physical education classes, but to work on art projects, science experiments, and writing. We often discuss these learning opportunities afterward in the staff room, which prompts more outdoor exploration to occur. The knowledge I have gained from research and coursework in this program have also given me the confidence to approach curriculum helping teachers, the district head of curriculum, and assistant superintendents over topics such as grants for outdoor exploration areas, workshop suggestions about play-based learning, and increasing social media use in the classroom.

I do not see myself leaving the classroom teaching environment for some time as a result of this graduate program. The learning I have undertaken in the program has reignited my passion for the classroom, and I enjoy using what I have learned with my students. I do see myself providing in-service, mentorship, and workshops to teachers and administrators who want to include outdoor exploration in their primary programs. Although I have no plans to present currently, it is an opportunity I hope to have in the near future. At this time, I plan to continue working with the teachers in my building as they develop outdoor exploration and mobile device usage in their classrooms. I would like to, eventually, work in or with the district curriculum department on outdoor learning programs or play-based learning ideas for students in the primary years.

The way in which I see my project and my graduate experience affecting my district is through advocacy for play, outdoor opportunities, and appropriate mobile usage in the classroom. The advocacy for these ideas comes at a time when curriculum changes are being implemented across this province and pedagogical ideals are shifting for some teachers. As a graduate of this program, I can help bring awareness of the challenges and successes, which come while teachers begin to implement outdoor exploration, playful learning, and mobile technology into their classrooms.

Recommendations

Three recommendations I would make to other educators interested in pursuing the topic of mobile device technology in outdoor learning experiences are listed below.

1) Be creative with the search terms for database searches. It was difficult to come up with search terms that fulfilled all of my requirements. I had to try a large

number of word combinations and found results using terms I was not familiar with.

2) Reflect on the successes and struggles of changing practice. I found as I was creating my project, I was able to look back through blog posts, written notes, and journals to remember what worked for me. I was able to pull my personal observations into my project.
3) Be mindful that technology is a tool to enhance the curriculum and the learning experience. Mobile devices and technology can be used in creative ways and can help support a variety of learners, but they are not meant to "deliver" curriculum.

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