At-promise Students:
a study of urban student learning in Alberta within the context of science education

by

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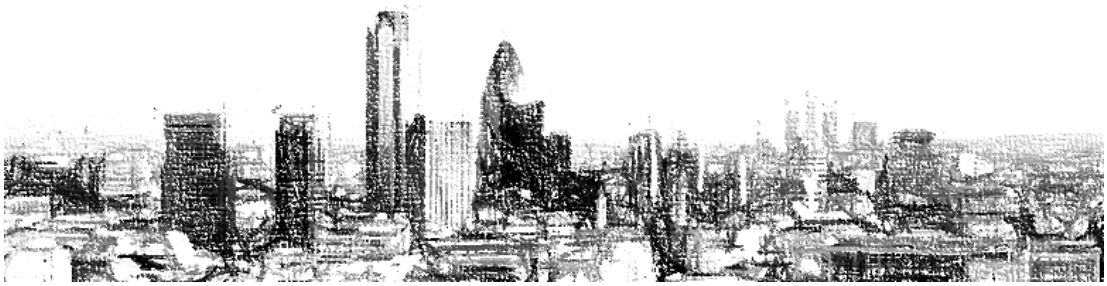
ABSTRACT

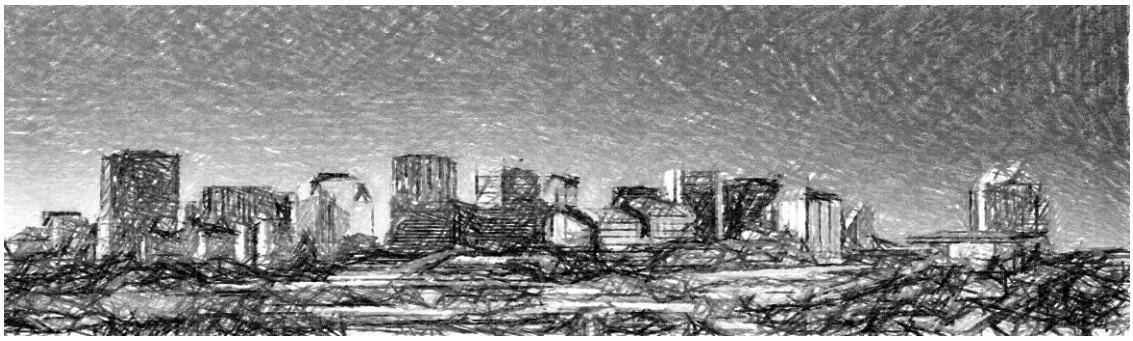
As teachers and educators, we have power, be it destructive or supportive. As such, we have a duty to our students to understand their complexities. The purpose of my research which utilizes a Constructivist Grounded Theory methodology by means of a case study approach in the context of science education is not aimed at an improvement of performance, but rather hopes to provide a situational and contextual understanding of learning. Urban youth live a life in flux, in almost constant change. A place of learning needs to acknowledge this fluctuation, as place is merely the backdrop for the potential for relationship-building and, thus, learning. The breakthroughs that occurred as a result of this research were not because of the location in which the learning took place, but because an opportunity was presented to nurture the space for relationships within the places – a concept I have coined as *'s/place.'* Within the place of school, spaces exist for relationship-building and the creation of hybrid identities in which students' multiple selves are acknowledged and thus *s/place* becomes the confluence of space and place. I conducted my research in an urban setting because students who live, study and work in urban environments are often overlooked. Their brilliance is dulled through a consistent grinding down of who they are and by being told that what they know is not valued. My hope is that my work demonstrates that change is not only possible but achievable if we are open to listening to the voices of the unheard and often overlooked youth in our classrooms.

Monica M. Chahal
Ph.D. - Dissertation

Preface

This thesis is an original work by Monica M. Chahal. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "Seeing Urban Youth through a Critical lens", No. 00032915, September 21, 2012.





Monica Manpreet Chahal

Improving urban student learning by merging places of learning with the spaces for relationship building.

Dedication

Oh the places you'll go,

Today is your day,

Your mountain is waiting.

So … get on your way!
- Dr. Seuss

The students from my past and the students in this research project doubted their value. This work is dedicated to all the boys I taught at Westminster City Boys School, in particular my form group 7P (I know you are no longer those 11-year-old boys). We were a family within the school and I never forgot you. Also, this work is dedicated to the Super-Six students from Hamlet that I had the privilege of working with. Because of all of you, the purpose of my work is to highlight your radiance as individuals filled with knowledge and ability. It is my experience working with urban students that has led me here, to the conclusion of this chapter of my life.

Acknowledgments

Silent gratitude isn't much use to anyone – G.B. Stern

By no means is this list complete as I do not have the space to thank all of the individuals who have supported me. Nevertheless, I would like to acknowledge a few persons of significance along this journey. First, thank you to my family for their unwavering support through my many (many) expeditions. In particular, thank you, Mom. My mentors Dr. Richardson, Dr. Johnston and Dr. Shanahan, thank you for holding my hand through the process but not dictating where I would go. Dr. Jerine Pegg, thank-you for stepping in at the 13th hour. Thank-you to my colleagues and friends: Mandy Krahn, Adrianna Boffa, Catherine VanKessel, Zahra Kasmali and Michelle Kilborn, for your encouragement and the odd glass of wine or two. To my long-time support group, Heather McLean, Jenny Alterajos and Anna Romano, thank you for your reassurance. Thank-you for being able to transform into amazing sounding boards, even when you had no idea what I was talking about, not letting me quit, brunches and a wine bottle or two. Kelly Cassault, thank you for keeping me in coffee. And last but not least, thank you Michael Goth, for your patience, support (in its many formations), a necessary push during this, at times, arduous process and unwavering love.

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Chapter 1: Introduction

Background

Unbeknownst to me, when I took my first job with the City of Edmonton as a summer leader I began my journey as an educator. Working with children/youth is a privilege; a privilege that at times has torn my heart apart. From those youthful days leading games on a playground to moving to London, England and working in an all-boys, inner-city school, to my current expedition, youth have been centre and forefront. Creating fairness and equity while honouring difference have become guiding forces in all that I do. The irony that the means to do this was within the subject of science is fitting. As a young student, I hated science. I found it difficult and tedious but I loved my science teachers. Becoming a science teacher was unintentional but I believe that everything has a reason and becoming a science teacher led to my opportunity to move to London. It led me here. So what does science mean to me? For me science is everything and everywhere, but as far as what does it mean to me, I am still unsure. As I began to unpack my own difficulties with my science education, I began to understand that I lacked connection, connection to what I was doing and who I was doing it for-that is, until I began teaching in a war zone, both literally and figuratively. These students both haunt and guide me. I have no idea where they are and if I made an impact, a teacher's curse I suppose, but they guide me to be better, to do better and to make change. It is because of them that I began this journey. My hope was that through my graduate career I could uncover the secret, the secret of how to make learning significant for those students living on the fringes of society. For me the word marginalised means pushed aside, on the outside, but these students are not outside looking in, often they are right in the middle of our classrooms, lives and neighbourhoods. They are dealing with poverty, abuse, death and many other things that we claim children should not be dealing

with. The truth is that they are. We, as educators, must begin to unravel how to create an educational system that honours all aspects of who they are. So that youth are no longer on the fringe but instead working within and towards something. All children have dreams and aspirations, mine did, but as they grew up their dreams became nothing more than wishful thinking. Children should not lose hope; they should be able to dream and aspire to a life beyond what exists for them. As an educator I believe my role is to help my students to do this. So what does science mean to me? Science is an avenue for youth to build their dreams and see beyond their lives in the present to a life that may be; science is an avenue for them to see the potential within themselves.

1.1 Who am I?

Think and wonder, wonder and think. — Dr. Seuss

I am the daughter of Balwinder and Paramjit Chahal. My parents were born in the Punjab region of India; my father was born a few years after India gained independence. My father remembers when the wall was erected to divide India and Pakistan, and the changes to the country that followed. Thus at a very young age he became politically aware, an awareness he passed on to his children. His parents were well off, he lived in a home filled with opulence and was the second son of four children, three boys and a girl. As a child of privilege he was sent to boarding school, but he was the youngest child there (only four) so every day his father would walk to watch him play and check that he was okay. That was the kind of love that surrounded my father. While my father's life was privileged, it was also traditional: men had certain roles to fulfil and women others. His older brother, as a result of expectations and tradition, was raised by their grandparents. My mother's life was very different. She was the daughter of a general and at 12 twelve her mother passed away. She and her younger sister went to an all-girls boarding

school run by Catholic nuns and her younger brother passed from family member to family member. At break they would live with their father in his compounds. As Sikhs they were in the minority and soon began to understand more in-depth the Hindu culture of the soldiers. My mother's life, also privileged, was filled with laughter, joy and family.

My father moved to Canada in 1970, arriving in Vancouver on November 3, and then to Nanaimo, colloquially known as Harbour City. He received his immigration papers on January 11, 1971. He then boarded a train and began his journey to Edmonton, which is where he received his landed immigrant status on June 25. He then went back to India in 1972, got married and returned to Canada with his new bride in 1973. Deciding to make Edmonton their home. When I asked my father about this time period of his life, there was no hesitation. His memories of these years are fresh in his mind: he was able to point out where the train stopped and what the city looked like, but he still hesitated to describe how he felt and his emotional state about leaving his home and family for the unknown. When I asked my mother about her immigration experience, she had no hesitation explaining how she felt alone and isolated: describing how her sari would drag in the snow behind her as she walked. My father's decision to begin his married life in Edmonton not only changed the course of his life and my mother's but also ultimately mine, my brothers' and those that come after us.

As a child growing up in Edmonton, I do not recall a period in my life in which I was not asked the question "where are you from?" As a child and youth I never understood the motivation behind the question: I was born here in Edmonton. I am a Canadian, so I would often respond as such. I would then hear "no no no where are you parents from?" These questions plagued me. I was asked by teachers, at work, on the street, and by my friends' parents. Meanwhile, my friends were never asked where they were from, even though we were all first

generation Canadians. I soon realised the reason I was asked, and not them, was because of my skin colour. In the 1980s and early 1990s, being of colour in Edmonton still meant being Other: to many, I could not be truly Canadian. Thus, for as long as I can remember I never felt like I belonged in the city in which I was born. The pictures, advertisements, movies that surrounded me represented an ideal that I was never going to be – blonde, blue-eyed and white. These feelings of Otherness were actualised at school, as my most vivid experiences of racialisation were via teachers. The school environment was normally a source of comfort and solitude. However, as I grew older it became one of trepidation and racism. One such example was when my best friend and I participated in a French language competition. We practiced for months and knew we were quite good. When we received second overall we found the teacher responsible to ask why. Our purpose was simple: as honours students we wanted to understand how we could improve. The teacher and judge looked directly at me and said "for those whom English is a second language, a third language is often difficult to achieve effectively." I was speechless; as a 15-year-old I had no idea why this teacher would think that English was my second language. I said nothing. My friend came to my defence but I never entered a language competition again. Years later I realised that this teacher projected his stereotypes of Other and difference onto me: he objectified me based on my colour and did not see me as an individual. My high school English teacher judged me similarly- which is why I chose English as my minor subject. Yet it was the implicit trust my parents had in my grade school teachers that was the most damaging.

When I was in kindergarten I could understand Punjabi, Hindi and English. However, soon after starting school my parents were informed by the administration and teacher that speaking to me in any language other than English would damage my ability to succeed in school. My parents, wanting to ensure success for their child and respecting the teacher and

administrators, listened. They then followed the same principal with my younger brother. Due to their implicit trust in the educational system, my brother and I are unable to communicate with our grandparents, cousins and extended family; the damage to our identity as Indian is tremendous. The decision to no longer to talk to us in Punjabi and Hindi has haunted my parents, and finally became apparent when they became grandparents. I overheard my father saying he would never make that mistake again, and thus both actively talk to my nephews in multiple languages. My brother and I fully support this, as we understand the integral link language has to culture and do not wish for his children, or my future ones, to ever feel the isolation of not belonging to the world that surrounds you (Edmonton) as well as not being a part of your own heritage or culture.

Looking at my kindergarten to Grade 12 school experience, I am filled with gratitude and sadness. While school was where I first experienced racism, it was also a place of solitude and safety. I did well, I participated in every club or sport possible, as the more time I spent at school the less time I spent at home. The reason for my desire to stay as long as possible during school days was because at times home was terrifying. As a young child I was responsible for my brother and if we did something wrong, it was I who suffered, whether verbally or via physical violence. The physical abuse ended when I was 14. The verbal abuse lasted much longer. So at school we excelled, my brother was the star athlete and I was the academic. We were successful and popular kids — school was where we could be kids. This is why I feel so strongly about the need for a school to be a safe zone providing the chance for kids to be kids, as who knows what their lives at home are like.

After high school I began my university career. I entered the first environmental conservation program in Canada and then followed it with a two-year after-degree in Education,

enabling me to combine my two passions. However, my entrance into the Faculty of Education at the University of Alberta was not easy. Having Indian parents meant I had two options for my first degree: science or law. Conservation was the most humanity-based science program I could find. However, I still found it very difficult, because at the time science was not my passion but something I had to do to get to the real goal, the Faculty of Education. I have always felt more comfortable with kids than with adults. My difficulty in my science courses meant that I did not have the required Grade Point Average to enter the Faculty of Education. I had worked and volunteered tirelessly, gaining experience working with youth, in an effort to build my resume. Thus, knowing that my grades could be a hindrance to my goal, I went every day to the education undergraduate office to seek an appointment with an advisor. My persistence paid off as I was granted an appointment with an advisor. I showed her my portfolio and resume and described why the Faculty of Education is where I belonged. I then left a letter explaining my passion and desire to be a teacher. I have been an educator (in some form or another) my entire life. Being accepted into the Faculty of Education and receiving my education degree (in which my average was extremely high) only solidified this career trajectory. During this time, I worked mainly with children from disadvantaged backgrounds. The playgrounds I preferred were those in the inner city, or high density areas. The practicum in which I most bonded with the students required that I deal with issues of drug use, abuse, and hunger. Within days of convocating with my education degree, I was teaching Grade Nine science in a junior high in west Edmonton, replacing a teacher on paternity leave. When my paternity leave cover ended, the class that I was the most attached to (nine-six) created a petition to try and keep me. Class nine-six was filled with the misfits of the school, yet on my last day each stopped to say good-bye. Even though I was a successful and wanted teacher, I was not ready for the life being laid out before me:

becoming a permanent teacher, buying a home and settling down. So when a friend asked if I wanted to backpack through Europe, I accepted.

Thus, at the end of June 2002, we packed up and left, with no idea of where we were going or what to expect. In July, I found myself in Cinque Terre with a new friend who happened to be a teacher. She informed me that in London, they were always looking for science teachers and that I should give it a try, and for some unknown reason it felt right. I called my parents from Rome and told them I was not coming back (ah youth!) and then realised I needed a visa and a job so moved back to Edmonton and became a substitute teacher at my old school until I left for London in January 2003. My father cried the day I left. It was the first time I had ever seen him shed a tear. I later learned that my father was crushed. He had thought that by moving to Canada, his children would not do what he did and leave — and here I was, leaving. I cried the entire flight to London. I knew one person in the city, I had nowhere to live and I was going to be a teacher in all-boys' inner city school. I was terrified.

Initially, I had a two-year holiday visa, but after my first day I thought I would only stay till my contract ended, in July. I began that first day with three other new foreign teachers (all Australian). The boys were ruthless. I had never experienced such disrespect and I had no idea how to control my classrooms. I entered my first classroom at Westminster City School, students refused to sit or listen to instructions. Students walked in and out of the classroom stealing classroom furniture, this pattern continued with all of my classes. My youngest and oldest groups of students were reasonable: they were my respite. However, during those first six months, things slowly changed. After every school break, I returned and the boys began to ask me if I was coming back the next month. I soon realised that these boys were tough because they had to be: they had lost trust in those that taught them and the system at large, and in a way the system

had lost faith in them. There were very few opportunities for those that were not "gifted" to do anything fun, or educationally relevant beyond the classroom. I soon realised that these boys were my brothers: they were young men of colour who were not academic, who struggled to find the right friends, who loved sports and who seemed to always be in the wrong place at the wrong time. So I decided that I wanted to create opportunities for learning beyond the school. I began taking students on field trips. Being the first science teacher to do this, I soon became the gifted-and-talented co-ordinator, the access-to-medicine lady, the environmental club leader and much more. I was the "go-to" person for opportunities in science. If there was a program in the City, I was going to find it and find the kids who would most benefit or simply needed it. Before I knew it, seven years had passed and my young form group of 26, 11-year-olds were graduating.

For a long time, London was a place where I fit. I was different, but if someone asked me where I was from it was not because I was brown but instead because I had an accent. They would often guess American and then would quickly apologise. Moving to England, like my father moving to Canada, changed my life. It was the instigator for my passion to travel and the reason for my focus working with youth living in urban environments. A large reason I love to travel so much is because one soon realises that everyone is from somewhere and nowhere: travelling creates a community of Others.

In the English school system, you start with a form group and stay with them until either you leave or they do. Every year my students would ask when I would leave and I would say I will be here till the end of the school year. It turned out that I was with them for the entire time – years seven to 13. My mantra to my students when they were in year seven was that we were a family within the school and would treat each other accordingly. I never left, and for these boys that was significant: their questions of when I would leave were a test. They wanted to know,

was I worth investing in? When they stopped asking me if I was leaving, I had finally become a part of their community: they knew that I was there for them and would do my damnedest to support them in any way I could. We had many tumultuous years-the London bombings, the death of a sibling, the murder of a fellow student, the violent assault of a teacher and the assaults of many of my boys. I was even attacked by a student. But we were a family and I supported them and they supported me. I ended up staying at the school not for myself but for them, and I was not the only teacher who did this.

While the national curriculum in the United Kingdom (U.K.) is very good, it was not relevant to my students' lives and situations. The students in my classes lived amongst gangs and drugs. They did not have extra money for tutors, sports or field trips. All extra-curricular activities either cost £1 or were covered by the school. More than 70% of the students received free school lunches, and by my final year more than 75% of the Year seven students were from single-family homes. My students in England consisted mainly of Ghanaian and Ugandan youth. However as the European Union expanded, the student population began to change, with an increase of students from Eastern European countries such as Poland. While these students still lived in the same neighbourhoods as each other, they were further marginalised by their inability to speak English.

The boys comprised a certain segment of the English population — a marginalised and often forgotten segment. The curriculum that I taught them did not reflect their lives or who they were, it was created by the white upper class of English society. For many of my students, school was somewhere to be safe and my classroom was where their dreams where discussed and possible, regardless of their labels as "gifted" or "troubled." However, the chance to fulfil their

dreams was restricted due to the reality of their situations and the constraints of the society in which they lived.

As an urban educator, I understand the need for a pertinent science curriculum for urban youth that reflects their lived experiences. In my experience, science as it is currently exists does not build on the tacit knowledge of urban youth. My students were from some of the poorest neighbourhoods in the city. But being poor should not mean a lack of opportunity. For example, I was able to create programs and lessons that were not only engaging but aided my students in pursuing their goals (medical school, engineering, architecture) in some of the best schools in the U.K. While in England I was constantly promoted, but more importantly I piloted and facilitated many projects across London, such as Access to Medicine-Kings University, Robot Wars-Imperial College, and the Volcano Project-The Royal Academy of Science. Through these projects, my students realised that they had important knowledge to share and that they were capable and worthy of a truly valuable education. I believe all children deserve such awareness and opportunities. I wanted to be in a position where I could provide children with those opportunities, thus my current position as a graduate student.

As children of immigrants, my brother and I experienced circumstances similar to those of my students. I understood their struggles and the adversity they faced. I am enormously aware of the importance of school - as a place of learning and a place to be safe, but also a place that has the potential to do damage. Place has become central to me in understanding my own work, myself and my students. Within my school I was one of only six teachers of colour — and the only one who remained for the duration of my form group's school experience. What I have noticed is that teachers in schools are predominately white, and the administration in schools is also predominately white (in both Edmonton and London England). Educational institutions

(including universities) do not reflect the population as it is stands today but instead reflect something as it once was. I can't help but ask why? Why are educational institutions still not representative of the differences in society?

Some may ask, "does this matter?" and my unequivocal answer is yes. Personally, I would have loved the opportunity to talk to a teacher that I felt might have understood my background and circumstances. As a teacher I was able to have difficult conversations that my fellow white teachers were not able to have with our students. Anecdotally, I have heard from students how positive their school experience would have been if they had a person in the school that they felt understood them on some level — as an immigrant, a minority, a poor person or someone from an urban environment. All people regardless of sex, gender, ethnicity or economics desire a feeling of understanding and belonging. My goal is to provide this through relevance by connecting what is taught to who is present in the classroom.

During the fourth year at my school (2007) in London, I began a full-time Masters in Policy Studies in Education degree at the University of London: Institute of Education (I.O.E.). I felt that if I could impact policy, perhaps my students would have a chance to achieve their goals. Working full time as a teacher and administrator while going to school was exhausting but I found a new love of learning. I loved my experience at the I.O.E., and it inspired a passion for further education. My M.A. in general focused on teacher autonomy within a neoliberal discourse of performativity and accountability. After earning my degree in 2008 I left England and wandered through Australia and Indonesia. Many months later I ended up back where I started, in Edmonton.

I recalled how much I loved my M.A. so I decided to inquire about a Ph.D. program, meeting Dr. Terry Carson in the summer of 2009. I explained my experiences and my desire to work for youth in diverse urban areas. Dr. Carson encouraged me to apply. If not for him I would not be here about to earn my Ph.D. and embark on the next part of my journey. When considering what to write for my application essay, I realised that I had examined (somewhat) the experiences of teachers under a neo-liberal discourse. However, I did not look at or examine student experiences. Thus I realised (for me) in order to create true change for urban students, I needed to work with students. This is why I switched from policy to secondary education. My first year back in Edmonton was extremely difficult and at times I wondered if I had made the right decision. I felt disconnected from those around me and once again had a feeling of not belonging. As a result, I often felt that I was being pulled in a variety of directions. Then I remembered why I went back to school. I was furthering my education so that I would be able to help children who "don't matter" because they have no voice, no place, no feeling of belonging, a criminal record or perhaps are in the foster care system. I was there to help children who are from visible, ethnic minorities and/or lower economic strata resulting in marginalisation in their education.

As an individual from a visible ethnic background who also was not a perfect student, I represent what passion and dedication can achieve. I am a goal-orientated and focused individual with a desire to create a better educational system for those children that are Otherized by our current educational system.

1.2 Presenting the Research

If we knew what it was we were doing, it would not be called research, would it?- Albert Einstein

The aim of my research was to investigate how urban students, when provided with the opportunity, begin to personalise and identify with their science education. My intention was to explore multiple ways to foster students' personal agency through feeling a sense of pride and passion about science. This exploration was located in an urban setting, as urban spaces are areas of unequal cultural, economic and social capital (Bourdieu, 2006). Sites in which inequitable power relations exist (Apple, 1993; Apple, 2001; Freire, 1989; Willis, 1981); of colonisation (Freire, 1989; Haymes, 1995; Krahn Derwing & Abu-Laban, 2003). Within my work the concept of liminal space (Bhabha, 1994) is central. When discussing liminality, I am referring to a metaphorical in-between state/space. Spaces are found within walls and boundaries. Spaces separate one "wall from another." Figuratively these walls are the boundaries that surround urban youth; thus, the in-between spaces are the spaces that are found between the boundaries/walls between the students. These walls, or what hooks (1990) refers to as margins, form a border that at times can confine those found within it. Yet, this bordered space also finds the youth within it on a threshold, in which a possibility for change exists. As hooks (1984) explains, "to be in the margin is to be a part of the whole but outside the main body" (p. ix). Within this discussion the borders of the liminal are established via the urban constructs of colonialism. Youth pass through this space interacting with different aspects of the space (school, home, work, etc.) simultaneously. One such aspect, science education, is influenced by the dominant Western culture in which most children are taught (Chahal & Harding, 2011; O'Brian, 2001), but research indicates that current approaches to science education do not account for urban children in poverty (Calabrese-Barton, 2003; Emdin, 2008). As the global

focus on scientific literacy and Science, Technology, Engineering and Mathematics education increases, it is essential to address the disparity between traditional approaches to science education and the hybrid lived experiences of urban youth. Thus, in search of answers to the question of how the science curriculum can be made more meaningful for urban youth, my research question asks, **How can pedagogy of place enable students to use their liminal space within the urban environment to critically engage with their science education?**

The narrative for my research begins in the sixth largest school district in Canada, where I worked with six Grade Eight students in a kindergarten to Grade Nine school (referred to here as Hamlet School). In Hamlet School, I facilitated a new science unit, Saltwater and Freshwater Ecosystems (Alberta Education, 2003; see Appendix E: Unit Background Information), and conducted observations as a participant researcher. Hamlet School, in Alberta, is located in Edmonton one of the fastest growing cities in Canada. Edmonton's population now ranks it as the fifth largest city in Canada (Statcan.gc.ca, 2015) and it "has one of the youngest populations in Canada" (Pratap, 2015). Approximately 30.3% of the population is 24 and under and has had the second highest overall growth rate in Canada (Statcan.gc.ca, 2015). The community surrounding Hamlet School has approximately 519 elementary/junior high school-aged children. Of those, 258 students attend Hamlet. Thus the majority of the school's 606 students are from outside of the surrounding community (Epsb.ca, 2015) and are part of the larger urban community; 10.2% of the school community are English as a Second Language learners and 16.1% are special needs learners (Alberta.compareschoolrankings.org, 2015). Schools found in Edmonton's urban centres are struggling to fill their classrooms. Hamlet is no different with a steady decrease in total school population from 2010-2015.

In my research, I used Bhabha's (1994) notion of liminal space and expanded it into a concept of third space (Roth 2008, Emdin, 2009). While both liminality and third space will be explored in greater depth later, briefly, in *Location of Culture* (1994) Bhabha encouraged a reconsideration of nationalism, representation, and resistance that above all stressed "hybridity" that characterises the site of colonial controversy–"a "liminal" space in which cultural differences articulate and, as Bhabha argues, actually produce imagined "constructions" of cultural and national identity" (Postcolonialweb.org, 2015). Roth, (2008) building on this, defines the third space as a convergence of the first space (home, community, peer networks) and second spaces (work, school church). The third space is thus "a hybrid space, in which the two other pure cultural forms come to be cobbled together in the process of a moment-to moment hybridization" (p. 903). Emdin (2009) expands Roth's (2008) notion of third space "as a *field* separate from the classroom or even school … where structures are manipulated to support students' agency" (p. 245). In my work the third space was situated within the school environment but is separated from the "formal" classroom setting, enabling students to explore their own relationship to their current and future science education in a locale of safety and security. My third space accounts for cultural difference, but not through a convergence as Roth suggests, or the separate field of Emdin's. Rather it was a space that was dynamic highlighting the differences in the students' lives. This issue of exploring relationships with curricular content is imperative as research indicates that children are able to address their own injustices as critical pedagogues when provided with the freedom to do so (Gruenewald, 2003; Gruenewald, 2003b; Kanpol 1998). My work with my focus group corroborated this theory. My goal was to take this approach with science education and use it to magnify the potential of creating truly authentic

scientific learning. I use authentic in the sense that the students find meaning within what they are learning that is personal and connected to their community and selves.

When I first prepared my candidacy paper, my focus and biases leaned toward two particular theoretical frameworks, critical theory/pedagogy and post-colonialism, reflecting my own personal belief system and speaking to who I am as a researcher (Corbin & Holt, 2005). I assumed that I would explore how the students worked within the constraints that are placed on them by those in power-constraints that are formed by where they live and study. Influencing the trajectory of their education from a place of deprivation. However, what I discovered was quite different. The focus became the liminal space itself and not place. The teacher and principal had placed the students on the margins of the liminal, a position that students involved in this study also accepted. Through my work with the students, the liminal space that was created transformed. As a result, the initial theoretical focus and biases discussed in my candidacy now must be extended to understand the convergence between space and place within the context of education. Additionally, it is important to note that, for me, the students I worked with were neither marginalised nor at risk, but rather "at-promise." For the remainder of this paper, marginalised shall be used only in reference to the literature discussed. For my own assertions, I shall use the phrase at-promise.

Chapter 2: Theoretical Frame

Familiarity, Critical Pedagogy, Postcolonialism

From the age of four to 17, I went to three schools: York Elementary, Steele Heights Junior High and M.E. LaZerte High School. These three schools were six blocks apart and formed a triangle that was the epoch of my world. My friends and I played until it was dark, rode our bikes to nearby farmers' fields and ravines. As I grew older, my friends acquired driver's licenses and cars. We were allowed to take the train downtown and my world expanded. I then began my university career, and for the first time felt alone. Of my high school graduating class of more than 300 students, fewer than 30 went to the University of Alberta. But more importantly, where I grew up and where I lived distinguished me, for the first time, as different, as ghetto. People I met would ask me where I went to high school and where I lived. As soon as I said M.E. or that I lived on 158 Avenue, the immediate response would be "Ohhh, you're Northside." I was distinguished as Other because I had grown up on the north side of the river, on the "wrong" side of the tracks. My classmates' definition of the Northside was that of a ghetto filled with drugs and violence. My classmates' version of Northside was inconsistent with my reality. Regardless of what my classmates' thought, I took solace in the fact that I was Northside. Yes there were drugs, yes my school was diverse, yes there was death and violence but I do not believe that the Northside was any more or less than any other areas of Edmonton, but being from the Northside meant that I had community, that I had roots; roots that have provided me with the strength to grow.

In choosing to utilise the Constructivist Grounded Theory around which this research is organised, there must be some form of "intimately familiarity with respondents and their worlds"

(Charmaz, 2003, p. 275). Underpinning this methodology are two theoretical frameworks: critical pedagogy and post-colonialism. The theoretical frameworks that I review in what follows are analogous to a literature review.

2.1 Familiarity

Be who you are and say what you feel, because those who mind don't matter, and those who matter don't mind ― Dr. Seuss

To be intimately familiar (Charmaz, 2003) with a research project, one must live in, on and around the topic. Charmaz (2003) advocates first-hand knowledge as "constructivist grounded theory reshapes the interaction between researcher and participant" (Mills et. al, p. 31, 2008). The means in which to reshape the binary between research and participant is to become immersed in the subject. The result of this emergence into the subject of study is collaboration between the researcher and participants which "produces the data, and therefore the meanings that the researcher observes and defines," (Charmaz, p. 35, 1995). As the researcher becomes immersed in the data the participants' voices become embedded in the final research outcome (Charmaz, 1995; Mills et al., 2008). My experience living, working and studying in urban centres has at times isolated and labelled me. As a result, I understand the importance of school — as a place of learning and a place to be safe, but also as a place that can isolate and damage. Being a visible minority in the 1980s and 1990s I always felt I stood out. My earliest memories of being racialised were in school, as teachers were the first to project their stereotype of Other onto me, objectifying me based on my colour. Combining that with the lack of representation in the curricula, my feeling of Otherness was actualised in school.

The beginning of deconstructing my personal barriers and understanding my own racialisation was when I crossed the physical barrier of the Atlantic Ocean to teach in England.

While I have always defined myself as Canadian I never felt truly Canadian. I was no longer that child who felt ashamed, who was mocked for being different. Instead I became an adult who attempted to possess her Otherness as an asset. This is what I believe is my biggest strength in undertaking this research. Through my experience I know how youth can feel when what they learn and what they see around them on a daily basis is not connected to who they are. By crossing literal and figurative boundaries I have come to understand the importance of deconstructing the imagined boundaries of identity and self. I soon discovered that in London everyone was from somewhere and from nowhere; I was in the liminal. Bhabha (1994) explains that "we" as a society are on a fine line, creating a need for classification of each other as something or as not-something as the "liminal space, in-between the designations of identity, becomes the process of symbolic interaction, the connective tissue that constructs the difference between upper and lower, black and white" (p. 5). *In Location of Culture*, Bhabha's (1994) explanation of the liminal or what he refers to as interstitial category occupies a space between competing cultural traditions, historical periods and critical methodologies. The liminal is a space in transition, in which individuals can occupy a position at or on both sides of a boundary/margin, or within the space between the boundaries. The individual is fluid as "we find ourselves in the moment of transit where space and time cross to produce complex figures of difference and identity, past and present, inside and outside, inclusion and exclusion" (Bhabha, 1994, p. 2). Within this notion of the liminal I was able to create my authentic self and begin to acknowledge my hybrid identity: a mix of Canadian, Indian, English and Urban. It was while working in London that I began to unpack why I was drawn to working with troubled youth; I saw my brother, my friends and myself reflected in my students. Life is hard. Teaching children and youth living in poverty and facing issues of abandonment and fear is difficult; not made any

easier when what we are teaching does not reflect who the people in front of us are. My students were seen as a marginalised and often a forgotten segment of the English population and were not recognised for what they really were – at-promise and living within the liminal.

2.2 Critical Pedagogy

I look back at my teaching career and remember my London students with fondness, sadness, wonderment and anger. I smile thinking of their joy and excitement, their desire to learn, I am bewildered at how they came to school each day refusing to give in. Give in to their circumstances, the structured and hierarchical biases that delineate them from the privileged few. I get angry remembering their lack of resources, spending recess chasing a ball in a playground that was in actuality a parking lot. The hotel used it as an overflow parking lot, but as the administration said, it was not a parking lot. My students treated their uniforms with respect, as they knew how hard their families worked to afford them their ties, jackets, pants, etc. When one boy lost a part of their uniform (tie, jacket, shoes) we all went on a hunting expedition to find it. The green space I created on the school roof was the only space of its kind and provided an area of respite to the misfits of the school. My students were poor, black and Other. They had loving parents who wanted the best for them. They had community: a community of peers within school, a community of loving family members at home, a community in faith – they were not lacking, they were trapped within a society that had deemed them as such.

We haven't got anything - Tara (12-research participant)

Understanding critical pedagogies connection to critical theory is necessary as critical pedagogy "shares some historical and contextual territory with critical theory" (Keesing-Styles, 2003). Critical theory is focused on issues concerning the socialisation of individuals through the dominant discourse at play; it becomes the starting point for critical pedagogy. With its roots in

Marxist political theory, critical pedagogy (stemming from critical theory) focuses on challenging the ideological ascendancy of the dominant culture in educational contexts. Early critical theorists "believed that Marxism had underemphasised the importance of cultural and media influences for the persistence of capitalism" (Burbules & Berk, p.4, 1999) in which hegemony is used to promote the capitalist agenda. These theorists also believed that institutions (such as schools) foster and reinforce the notion of meritocracy through consumerism. Critical pedagogy is a reaction against the institutionalised educational function of perpetuating the hegemonic norm of capitalism and questions notions of power and its unequal distribution. Critical pedagogy "sees society as fundamentally divided by relations of unequal power" (Burbules & Berk, para 3, 1999) and critical pedagogues are troubled by the unjust and biased status quo. Critical pedagogues are focused on those individuals and groups who are excluded and thus subjugated by social, economic and political capital. Critical theory and critical pedagogy both encompass notions of critical judgement, but differ in their notions of criticality. Criticality within the context of critical thinking suggests becoming aware of concepts, ideas or assertions with a discriminating eye (Burbules & Berk, 1999). While critical pedagogues look at power structures within society, the "primary preoccupation of critical pedagogy is with social injustice and how to transform inequitable, undemocratic, or oppressive institutions and social relations" (Burbules & Berk, para 6, 1999). The leaders in the critical pedagogy movement, Paulo Freire, Henry Giroux, and Michael Apple, insist that education is political, and as such educators should become transformative intellectuals (Giroux, 1988). In particular for Freire (1989), critical pedagogy is concerned with developing *conscienticizao* (conscious raising) in which an individual becomes aware of the systems of oppression and their place within the system. In order for *conscienticizao* to occur, critical pedagogy must be at play. As such, I

contend that not only adults but children can also become cultural workers (Freire, 1989) who, when given the opportunity, can, themselves, "*identify* and *redress* (my emphasis) the injustices, inequalities, and myths of an often oppressive world" (Gruenewald, 2003, p. 4). Thus, youth must be included in challenging institutionally engrained epistemological views of the dominant culture. Critical pedagogues "seek a kind of knowledge that will help students recognise the social function of particular forms of knowledge" (McLaren, p. 195, 1989). I contend that students themselves, when provided with the opportunity, are critical pedagogues. However, for students to become cultural workers, the institutions in which they are educated must attempt to be made free of institutional biases. I use the term educated instead of schooled as school is where students are indoctrinated into a particular hegemonic norm within society. Whereas education is beyond the school context and allows for the opportunity for changes in pedagogical practice (McLaren, 1989). Change through critical pedagogy asks why "some forms of knowledge have more power and legitimacy than others" (McLaren, p. 196, 1989). In asking this same question, I analyse the subject of science and scrutinise its hidden curriculum. Critical pedagogues are also acutely aware of the role of politics, culture and economics within society and in particular schools (McLaren, 1989).

In the conversation that follows, in which I look at politics, culture and economics with regards to the urban environment, it is essential to understand the significance of class within the discussion. Class is defined as "the economic, social and political relationships that govern life in a given social order" (McLaren, p. 198, 1989). Within the context of my study, the social order is that which is found within the urban environment, and my discussion of class is embedded throughout. From a critical pedagogical perspective, to achieve the aim of identifying and redressing injustice, education pertaining to youth living and studying within urban environments

must be studied within the context of social justice (Ladson-Billing & Tate IV, 1995; Lauder, Brown, Dillabough & Halsey, 2006; Stoicovy, 2002; Tellez, 2002) by connecting the urban context to critical pedagogy. Urban centres are comprised of people who are often racially and socially isolated from those who make many of the decisions that influence education. I have experienced how educators, youth and parents in schools situated within urban contexts are often denied agency. The actors involved often have no voice in the direction of the education taking place, and no influence on the purpose of education within the context of their own schools. For me, an advantage of critical pedagogy is its focus on specific contexts (Freire, 1989), such as urban environments. From the perspective of critical pedagogy, students are being constructed via the discourse of neo-liberalism (Leathwood & O'Connell, 2003). Among the characteristics of neo-liberalism is the commodification of students through credentialism and marketisation (Chahal, 2008). Beyond unequal cultural, social and economic capital (Bourdieu, 2006), how does the discourse of neo-liberalism specifically relate to my use of critical pedagogy? I believe the answer to this question lies in the concept of hope. By focusing on the neo-liberal discourse of credentialism and marketisation, at-promise students are funnelled into pre-determined trajectories (Chahal, 2008). In order to offset these neo-liberal discourses, a space within the classroom for the integration of hope is needed. As hope aids in the development of students as critical pedagogues. As McLaren (1989) states, "do we want to create spaces of freedom in our classrooms and invite students to become agents of transformation and hope? I trust that we do." (p. 184, 1989). I whole-heartedly agree. However, hope exists in many manifestations.

2.2-1 Hopeful or Hopeless

> To let go of the desire to cure or rescue, to sit with the pain that compels us to reach for quick reforms, mindlessly write yet more grants that purport to offer, yet again, the solution to one or more horrible problems, to reframe standards in terms of our ability to remain open, to articulate and reflect on what we are feeling and experiencing, to face the terrors that gnaw at us, and to work through the fantasies that structure our thinking, to do these would be to begin to act ethically (Taubman, 2000, p. 31).

Taubman asks us to look at why we teach, what the real reason behind our desires to teach is, and questions our underlying belief in hope. We hope to aid students in becoming whatever it is they wish to be; we hope that they are able to strive and achieve. However, Taubman calls us to begin to work through the fantasies, and to address the real notions of what is it we are hoping for. The concept of hope has a multitude of definitions and, within education, a multitude of purposes. Giroux (2009) discusses "a politics of educated hope" (p. 9), in which hope is something that is missing from education and from the curriculum. Resulting in a life filled with despair and desperation; however, I am more pragmatic. According to Taubman, (2000) hope within schools creates a false notion about the purpose of teaching -a hope that propagates the desire of the neo-liberal agenda to have students fulfil their roles within the market. If this is indeed the case, then hope would contradict current literature and approaches in critical pedagogy. As discussed by Burns and Nolan (2014) this hope is in actuality a fantasy disguised as hope, in which hope "perpetuates a defining sense of crisis and the urge to 'do something,' in which we lose ourselves in fantasy and lose our mindfulness of those with whom we sit and ostensibly serve" (p. 2). While I do not think we serve our students or schools, I do agree that the notion of hope has become fantastical. Hope is a fantasy in which we hope to teach our students to become lawyers, scientists, engineers or other appropriate "professionals" who

can then contribute economically to our society. For me, education should not be focused on "what if," but on "what is." For critical pedagogues, the discussion of hope is not a discussion of materialism or neo-liberalism and not a hope for personal satisfaction or commodification. Instead it is a discussion about a hope for a better, more equitable and more just world (Giroux, 2001). Currently, within classrooms "hope is packaged as the promise of neoliberal capitalism" (Giroux, 2001, p. 111), the promise of a high paying job, financial security, a home and a car. However, for youth at-promise living in urban environments, this type of hope is often unattainable (Taubman, 2000). As a result, students become discouraged and believe that school has no purpose. As Taubman explains (2009), everyone can learn equally if provided with the same "toolkit" of education. The results of such an education are identical, as education is a matter of hard work and dedication and everything else is equal. Therefore, as meritocracy reigns, the hegemonic norm that children from disadvantaged backgrounds are lazy and to blame for their own failure becomes established (McLaren, 1989). Taubman (2000) speaks to this directly as one of the main purposes of his book *Teaching by Numbers* was to,

> bring into focus the widespread belief that all students can learn as long as their teachers follow directions. For a variety of reasons, over the last eight years, teachers and teacher educators have embraced the most mechanistic approaches to pedagogy and curriculum in the belief that these would empower them and help their students (p. 2).

So rather than creating situations of hope, teachers, when buying into the fantasy of hope, are in actuality creating an environment of hopelessness, as the students in front of them are unable (due to political, economic or cultural biases) to obtain the neo-liberal desired end of this packaged hope. As Freire (1989) states, "dialogue cannot be carried on in a climate of hopelessness" (p. 80). I was determined that within my own research, I would prevent such a

climate of hopelessness founded on neo-liberal understandings of hope. Instead, I focused on the real conditions of students' personal and local lives. But in order for this to happen, I needed a clear understanding of how power plays into educational outcomes of youth in urban centres.

2.2-2 Power and Place

The most common way people give up their power is by thinking they don't have any
-Alice Walker

Power is entrenched within education; however, power has been "erased from any notion of teaching and learning" (Giroux, p. 3, 2011). Power is the "probability that one person in a relationship will be able to carry out his will despite resistance ... it is the ability to intervene in a given state of affairs so as to alter them as desired" (Bruce & Yearly, 2006, p. 241). Power can be personal (e.g., police), governmental (e.g., elected or appointed officials), or in the form of international influence (e.g., colonial power), or organisational (e.g. multi-national companies). As Apple (1993) notes, power infuses all aspects of education, the ability to decide what knowledge influences the curricula is "important about whom has power in society" (p. 222). As the curriculum is not neutral, it contains specific modes of knowledge deemed valid while negating others as not official. Youth in inner-city schools lack the power to influence the daily events of their educational situations. Their tacit knowledge is deemed unworthy, they lack agency, resulting in what can be deemed as nonconforming or misbehaving behaviour (Willis, 1981). The students who took part in this research were such nonconforming students, identifying themselves as the "bad class" or "dumb class," as they felt powerless within their educational setting. They felt alone, and a reaction to this was a sense of disillusionment. A "critical pedagogy of place challenges educators to reflect on the relationship between the kind

of education they pursue and the kind of places we inhabit and leave behind for future generations" (Gruenewald, 2003 p. 3), as place focuses on how education can socially reproduce the dominant ideology of a society (Gruenewald, 2003).

> From the perspective of place, conventional notions of accountability are problematic because they fail to recognize the mediating role that schools play in the production of space (or social context) through education of place makers (or citizens). Place-based educators often question reforms based on standards and testing because of their tendency to cut off the process of teaching and learning from community life, where students and teachers are learning all the time (Gruenewald, p. 620, 2003b).

McLaren (1989) and Taubman (2009) both discuss how standardisation and accountability under the neo-liberal discourse of performativity has permeated education and thus created this false sense of hope packaged in classrooms. Gruenewald (2003b) builds upon this by stating that place-based education in its many manifestations (eco-feminism, indigenous perspectives, phenomenologically, critical geography, critical social theory) is inherently able to create a space for thinking deeply about the places we occupy and how we interact with them. Place becomes an active member of the learning experience, which is in direct opposition to oppression.

As highlighted by Freire (1989), teachers, often unknowingly, support a banking mentality of education and as such prepare students for a life of oppression. One such form of oppression is the myth of opportunity, which for urban youth is nothing more than domination in action, as an increase in opportunity follows a positional consensus theory (Brown, 2006; Ranson, 2003). In which the belief is that an increase in credentials will eventually lead to an increase in educational and occupational opportunities. However, the myth of opportunity is

negated by the importance of position – how the economic and political decisions affect those in the inner city. Positional conflict theory (Brown, 2006; Taylor & Woollard 2003) asserts that one cannot disregard the importance of those with power and those without and as such, education can be transformed by the utilisation of barriers to enable those with power to keep their power (Olssen, 2006; Thomas, 2001). These barriers typically can be in the form of the unequal possession of social, economic or cultural capital (Bourdieu 2006; Thomas, 2001) and for those living within the urban context this disparity can be tremendous. Thus, education becomes subjugating rather than empowering. Additionally, these barriers form boundaries around those that find themselves within the liminal. The question then becomes how to transform these barriers of oppression.

2.2.3 Oppression and Reality

Knowledge is power. - Francis Bacon

Oppression is the exploitation and demoralisation of individuals. Education can be, at times, a means of indoctrination into an oppressive world (Freire, 1989). Education can be oppressive when it is "detached from reality, disconnected from the totality that engendered them and could give them significance" (Freire, 1989, p. 57), which is, in my experience, what happens within the urban core. As a result, when leaving school, youth "adapt to the world as it is and to the fragmented view of reality deposited in them" (Freire, 1989, p. 60). What this process of adaptation illustrates is a disconnection between what at-promise students are taught, how they are taught and why they are taught. To disrupt this disconnection, the student/teacher relationship needs to shift in the direction of more democratic and cooperative learning environments. According to Freire (1989), this shift requires the teacher to move from teaching

for the students *about* a topic to teaching *with* the students in relation to their reality. I worked *with* the students as they taught themselves and each other. Freire (1989) defines this as problem-posing education, in which truth is constantly revealed. Through this form of education, the "teacher is no longer the one-who-teaches, but one who is himself taught in dialogue with the students, who in turn while being taught also teaches" (Freire, 1989, p. 67). In this process, roles are not reversed; instead "co-intentional education" (Freire, 1989, p. 56) is generated. Consequently, the education that students receive has a purpose and focus connected to the students themselves. According to Freire (1989), this shift would mean that "teachers and students, co-intent on reality, are both Subjects, not *only relation to unveiling* reality, and thereby coming to know it critically, but in the task of re-creating that knowledge" (p. 56). The knowledge that surfaces through "invention and re-invention" (Freire, 1989, p. 58) is both unique and significant, and as my research will illustrate, potentially meaningful. For Freire (1989), problem-posing education allows individuals to "develop their power to perceive critically *the way they exist* in the world *with which* and *in which* (my emphasis) they find themselves; they come to see the world not as static reality, but as **a** reality in process, in transformation" (p. 60). However, for me, Freire is advocating a singular form of reality whereas I believe that reality, like time, is transitional and individualistic. I contend that each oppressed individual and each oppressor constructs their own reality and this reality ebbs and flows through place and space. Freire (1989) argues that "the teacher talks about reality as if it were motionless, static, compartmentalized, and predictable" (p. 57) but the reality of at-promise youth is not motionless, static, compartmentalized and predictable as my participants illustrate.

2.2.4 The Place and Person

A critical pedagogy of place identifies "places" as the contexts in which situations are perceived and acted on.

> A critical pedagogy of place, that is, it must address the specificities of the experiences, problems languages, histories that students and communities rely upon to construct a narrative of collective identity and possible transformation (Giroux & McLaren, p. 163, 1990).

A critical pedagogy of place coexists with the "particularities of where people actually live" (Gruenewald, 2003 p. 4) and acknowledges the positional conflict inherent in policy and practice. Specifically, a critical pedagogy of place addresses "the spatial aspects of social experience" (Gruenewald, 2003, p. 3) by discussing the link between place and critical pedagogy. While Gruenewald (2003) focuses on connecting the pedagogy of place to eco-justice through experiential learning, contextual learning and constructivism, my intention was to move Gruenewald's discussion on a tangent. Rather than looking at the ecological implications of critical placed based education, I hoped to explore how critical pedagogy of place enabled students to use their liminal space within the urban environment to critically engage with their education. At no point in my candidacy or now do I suggest that an environmental focus is not important; however, for the purpose of my work, I would rather explore how place impacts learning and integrate Gruenewald's focus on linking place to critical pedagogy as places are inherently pedagogical (Gruenewald, 2003b). Gruenewald notes that often place-based education is discussed "at a distance from the urban, multicultural arena, territory" (2003, p. 4) as there seems to be a hesitancy to discuss issues of urbanisation and gentrification. Haymes (1995) further expands the concept of place by imagining the concept of place as a means for Black Americans to decolonise their own situationality, advocating a critical multiculturalism. In this

research, using place as my main conceptual framework allowed me to look beyond the person to the bigger narratives at play. As Stoicovy (2002) states,

> the culture of the school experienced by the child is very different from the culture of the family and community in which the child lives. The result is that schools frequently become discontinuous or out of sync with the populations they serve. Culturally responsive pedagogy seeks to remedy this situation by culturally contextualising the teaching–learning process (p. 80).

The focus for Stoicovy (2002) is culture and community, and connecting both to school. Ultimately, a critical pedagogy of place seeks "decolonization and reinhabitation through synthesizing critical and place-based approaches" (Gruenewald, 2003, p. 3).

2.2-5 S/place, not Place

What was discovered through my data was that critical pedagogy is not just about becoming critically aware of place, but opening up to the potential of the spaces surrounding each student, a pedagogy of space and place – a particular understanding I have termed a critical pedagogy of "s/place." Throughout my research, I discovered that in order to properly explain what had occurred, I had to integrate the concepts of hybridity, liminality, place and space. Thus I coined the term s/place. The details of this melding are discussed in further chapters. To put it simply, the participating youth live in the urban environment; the urban environment consists of a diversity of places found within the liminal. As a result, the youth are hybrids, and it is the place of school that unifies these hybrid selves. Within the place of school, spaces exist for relationship building and the creation of a hybrid identity in which their multiple selves are acknowledged – s/place is the confluence of space and place. This convergence occurred when

my attempt at creating a routine failed and instead a routine of s/place emerged. By looking at the s/place, the youth are no longer placed along a dualistic binary but are appreciated as individuals within the new urban environment, and within this shifting environment, place no longer becomes central; rather, the space within the place (s/place) becomes critical. For the youth as they become critical pedagogues focusing on s/place, the spaces within the places were figuratively reduced -allowing for relationship building. As the third space of learning was a rotating space (university lab, multi-purpose room, hallway etc.) the students were not focused on where they were learning but rather on who they were learning with. This shift in focus coincided with the realisation that as urban youth, the students' lives were unpredictable and unstable and that there places of learning should reflect this. Consequently, in later chapters I explain how through my concept of s/place, I am able to connect the "how" of my work to the "why" (i.e. why it is important). For instance how the routine of s/place resulted in the students' empowerment. Thus, my question was actually shifted to become **"How can a pedagogy of s/place enable students to use their liminal space within the urban environment to critically engage with their science education?"** The motivation behind this change is discussed in subsequent chapters.

To understand the power of s/place for the education of urban youth, it is important to explore the historical significance of the urban as a site of colonisation.

2.3 A Postcolonial World

I take the train home every day. The sky is grey. There is neither grass nor trees. I get to school and gaze in wonderment as the students organise their games during break time. I have no comprehension of how they know who is playing what game, but that doesn't matter: they know. The school is surrounded by borders, reminding the teachers and students where they are: the south border is a halfway home, the north is our gym, which is surrounded by shops and one can hear the London Underground running below. To the west is a posh hotel, somewhere I have never entered. To the east, a side road leads to Buckingham Palace. This is my old school: a place surrounded by what we lack. Our school, due to nothing more than location, conducts its end-of-term services at Westminster Abbey. Every time the students walk to the Abbey, they pass by the greenery and gates of what money can buy. They run on the grass and they play, and then they notice. They notice they are different, they notice this when they ask me "why are people taking our photos? Why does that man say in his day the people in the school were different?" They notice something that they cannot place.

Every year I take my students out of London, the oldest under the guise of a field study, the youngest as part of a nature program. Every time without fail, my students notice they are different.

They ask me, "are we the only boys of colour here?" They ask me, "does everyone here have a car?" They ask me, "do all of these people have backyards?" Then they know for sure, they are different.

When I return to London, "I overhear my students yell, there is a black man on the street, we're home". I was wrong, they noticed — they are different.

He was like the foundation *of Hamlet* because like he knew all about *Hamlet* … it's really ghetto, there was a lot of bad kids – Iham (12-research participant)

As stated by Gruenewald, "when undertaking a pedagogy of space one begins to understand that one function of space … is hegemonic: Domination is maintained not through material force but through material forms" (p. 628, 2009), as the colonised live within a particular space, and decolonisation requires the removal of both physical and psychological barriers to their lives. When I taught in England, my former students lived in a grey London where there was no greenery to play on and their lives were surrounded by those that looked like them. To be of colour was the norm, to be white was not. There was one exception those in power. The headmaster, deputy headmaster, assistant heads and department heads were all white males. Even though I created many experiences for my students outside the classroom, I soon noticed that in all of the institutions I worked with (London City Hall, Royal Society of Science, Imperial College, Kings College and more), my contact was always a white male. Consequently, to me the urban space of inner city London was (and remains) a site of colonial oppression. "Places teach us about how the world works and how our lives fit into the spaces we occupy" (Gruenewald, p. 621, 2003b), so what did the environment that surrounded my students teach them about how the world works? It taught them that power lies in the hands of white men.

Initially in my candidacy paper, I thought that Karanja's (2010) understanding of Bhabha's notion of hybridity as "the straddling of two cultures and the subsequent ability to negotiate the difference" (p.4) would be the cornerstone of my work. However, throughout my experience I have found an amalgamation of the concepts of hybridity, liminal, place and space in the pedagogy of s/place as the actual cornerstone. With regards to the liminal space, the margin or "marginality becomes a place of hope where through 'radical openness' to other forms

of marginality, communities, of affiliation can emerge that oppose multiple forms of domination" (Gruenewald, p. 632, 2003). With respect to my own research, these margins are occupied by the students. The spaces that exist between each individual allow for the emergence of true hope, not the neo-liberal fantasy of hope. The place of the liminal becomes reformed to perpetuate change rather than oppression and causes one to question the hegemonic norm (as perpetuated via a neo-liberal discourse). The individual student within my work must be understood as occupying multiple (hybrid) selves. It is the connection of these hybrid selves to the place of school within an urban environment that allows the space for relationship building, thus s/place.

2.3-1 What is Colonialism?

For if you are Canadian, home is a place that is not home to you - Dennis Lee

The children/youth in this study do not cross beyond their neighbourhoods, they do not venture past their comfort zone for fear of being thought of as different. The parents of the students wished for a better life, wanted their children to be more than … more than them, more than different, more than the environment that enveloped their children. Cities are landscapes in which the rich and poor exist throughout. However, the poor, immigrants and other marginalised populations tend to live within particular confined areas due to a history of segregation and division. Urban spaces may not be colonised in a "traditional" sense but that does not take away from their colonising nature.

> The colonization and displacement of disenfranchised cultural groups (sic) epitome of how power has operated historically through the production of space, how power affects

> and controls people and places simultaneously. The message here is that power depends on, is facilitated by, and is reflected in the development and control of geographical space (Gruenewald, p. 630, 2003b).

The urban environment has its own culture, language and sense, and this is overtly expressed in the media via programming like *Misfits* (Overman, Ferguson, Jarvis & Fried, 2009), *Skins* (Elsley et al., 2007) or films such as *Attack the Block* (Park, Wilson & Cornish, 2011) and *Boys in the Hood* (Nicolaides & Singleton, 1991). As shown by these examples, perceptions of what constitutes urban have existed in the media for decades. However, what do these projections teach the youth that live within the urban environment? "Places produce and teach particular ways of thinking about being in the world. They tell us the way things are, even when they operate pedagogically beneath a conscious level" (Gruenewald, p. 627, 2003b). The lead in the film *Attack the Block* (Park, Wilson & Cornish, 2011), John Boyega (previously Oboyega), is a former student of mine. His accent in the film is not fake, his attitude and the life that the film replicates in the council estates of London, are representative of his life and the lives of his friends. The question many of my colleagues asked was, how much of that character was acting and how much was just John? Media significations express a certain type of "life" that exists within the urban, a life that is comprised of "learning to live-in-place in an area that has been disrupted and injured through past exploitation" (Berg & Dasmann, 1990 p. 35), a phenomenon known as "reinhabitation" (Berg & Dasmann, 1990).

In essence, reinhabitation is a form of resistance in which an individual begins to imagine a new way of existing within the confines of the space(s) that he or she occupies (Berg & Dasmann, 1990; Gruenewald, 2006; Scully, 2012). Resistance or reinhabitation is "place consciousness *which* provides a frame of reference from which one can identify, and potentially

resist, the colonising practices of schooling as a function of the larger culture and its political economy" (Greenwood (formerly Gruenewald), 2009, p. 1) and that is exactly what John and his friends did in *Attack the Block* (Park, Wilson & Cornish, 2011). The life that is epitomised in *Attack the Block* (Park, Wilson & Cornish, 2011) is that of crime and the gritty nature of estate living. When aliens overrun their home, Pest (the character played by John) and his friends are the ones who defend the estate. They do not call the authorities due to their mistrust, as exemplified by the following dialogue:

Sam: We should call the police.

Pest: You'd be better off calling the Ghostbusters love

Pest: They arrest us for nothing anyway

Moses: … the Feds sent them anyway. Government probably bred those things to kill black boys. First they sent in drugs, then they sent guns and now they're sending monsters in to kill us. They don't care man. We ain't killing each other fast enough. So they decided to speed up the process.

Pest: Believe!

As Haymes (1995) explains, urban centres did not just "spring-up": they were deliberate means to segregate certain populations, particularly visible minorities and the poor, from the white majority. Movies such as *Attack the Block* (Park, Wilson & Cornish, 2011) convey this message of segregation to the wider public.

2.3-2 The Urban Core as Place of Marginalization

A city is more than a place in space, it is a drama in time — Patrick Geddes

Historically, through the creation and implementation of state housing, "class rigidity was built into the physical landscape" (Barker, 2007, para. 3), providing a means for the physical separation of the Other from society. These areas, according to Morrison (2007), were "deprived of any sense of neighbourhood" (para. 3) and instead formed a ghettoization (Barker, 2007). For those living within these ghettos, education is seen as the means out (Morrison, 2007), which is a restatement of Taubman`s (2000) commentary in which the focus in schools is often placed on something that is out of reach for the majority of the populace. What this emphasis on education as a means of escape illustrates is a lack of recognition that what is taught to students in inner city environments may not be relevant to their place – the pedagogy of place enacted is irrelevant. Hanley (2007) believes that schools found within areas of deprivation create a "wall in the head, a sense of exclusion from the wider world and its freedoms" (para. 7). As a result, those who are able to "escape" are made to feel a type of "escapee guilt." Both of these feelings, exclusion and guilt, are pervasive amongst those who are educated within a colony.

2.3-3 Evolution of Canadian Immigration

> Richard Tait, chairman of the Canadian Immigration and Population Study, which issued the Green Paper of 1975 *stated* (my emphasis) that a hundred years from now, I don't suppose people will care all that much whether we legalized marijuana or not. But decisions about who we let into Canada will decide the kind of country we have 100 years from now (Knowles, p. 9, 2007).

As explained by Knowles (2007), "British immigration [did] much to stamp the character of Canada" (p. 67). Although within Canada the means of segregating Others did not always take the form of ghettoization (Barker, 2007) that existed in London, division does exist and thus the notion of colonisation is just as present. As a young country, Canada was founded on immigration as.

> the people who have come to Canada, have, by their efforts and talents, fashioned this country's institutions, political and economic character, and cultural diversity. In short they have made Canada what it is today (Knowles, p. 9, 2007).

However, the origins of the people who have come to Canada have varied according to immigration policies, many of which (in the past) were based on racist beliefs (Driedger, 1999; Knowles, 1997; Krahn, Derwing & Abu-Laban, 2003).

Historically, it is clear that immigration policies have been racist (Driedger, 1999; Knowles, 2007; Krahn, Derwing & Abu-Laban, 2003), based on a notion of who was considered desirable for the future of the country. In the 19th century, restrictions were placed on immigrants based on class, occupation, religion (which religions depended on who was in power) and place of origin (immigration was restricted for anyone from Ireland, Scotland and France). Also restricted was where individuals could immigrate to within the country (Knowles, 2007). However, due to changes in the world (war, famine), restrictions for the Scottish and Irish were slowly lifted and "the population of British North America grew from less than 500,000 people in 1812 to approximately 2.4 million in 1850. By 1867, the year of Confederation, two-thirds of British North America's population was British in origin" (Knowles, p. 49, 2007). A major reason for the changes to allow Irish immigration was a fear that the poor in Ireland, due to

famine, would immigrate to Britain. The result was to push the poor Irish to the British colonies (Knowles, 2007). In 1859, with immigration recruitment becoming departmentalised, offices were opened in the U.K. and Germany) to "discourage the promiscuous emigration of mechanics, clerks, and house servants, for whom there was no demand in Canada. Instead, "the emigration of small farmers and agricultural labourers" was encouraged" (Knowles, p. 67, 2007). In the latter 30 years of the 19th century, Sir John A. Macdonald and the Conservatives "attached a high priority to luring new settlers" (Knowles, p. 68, 2007) to Canada, as Macdonald was thinking of the need to build the nation from ocean to ocean. Thus for him, focusing on the West became of the utmost importance, yet there still existed targeted immigration policies in which only the "desirable" were sought.

> No sooner had the fledgling dominion come into being than measures were taken to establish a network of emigration agents to advertise this country's attractions to prospective immigrants. Until the advent of the First World War, these immigration salesmen would target farmers with capital, agricultural labourers, and female domestics, preferably from Great Britain, the United States and northern Europe, in that order … those sought were "men of good muscle who are willing to hustle." Not so welcome were individuals with professions, clerks, or other prospective immigrants of sedentary occupation. They were actually discouraged from emigrating to Canada, while artisans, mechanics, and tradesmen, if not discouraged from doing so, were certainly not courted (Knowles, p. 69, 2007).

However, during this time and throughout the Macdonald era there were active policies to discourage the visible minorities from emigrating to Canada. These policies included the 1885 head-tax ($50.00), which was to restrict and, more importantly, regulate Chinese immigration.

While the act did not place an outright ban on Chinese immigration, it did make it difficult for many Chinese immigrants to enter Canada (Krahn et. al, 2003; Knowles, 2007). This policy was a considerable change and was not advocated by all:

> When introducing the head-tax bill, Secretary of State Joseph Adolph Chapleau conceded that placing racial limits on immigration abolished a long tradition of whereby British soil was open to any member of the human family" (Knowles, p. 71, 2007).

Thus the "foundations had been laid for restrictive (later exclusionist) immigration policy" (Knowles, p. 73, 2007). On April 8, 1905, Frank Oliver, a Liberal, became the Minister of the Interior and Superintendent of Indian Affairs, foreshadowing significant changes in Canada's immigration policy. Oliver was an Easterner but made Edmonton his home. Unlike his predecessor (Clifford Sifton), Oliver, like many of his fellow Westerners, was concerned that "sizable pockets of unassimilable ethnic groups [were] establishing themselves across the West" (Knowles, p. 104, 2007). For Oliver "ethnic and cultural origins of prospective immigrants took precedence" (Knowles, p. 106, 2007). In 1910, the Federal Immigration Act enabled governments the right to refuse "immigrants belonging to any race deemed unsuited to the climate or requirements of Canada" (Krahn et. al, 2003, p. 3). However, due to the plight of many refugees following World War II, there was an outcry by the public for the government to reform its policies. These same citizens challenged the notion that immigration caused unemployment and economic downturns. One result of this outcry was the creation of sponsorship programs (Krahn, Derwing & Abu-Laban. 2003; Knowles, 2007). Between 1947 and 1957, there was an easing of immigration policies with regards to sponsorship, however the racist undertones still existed.

> Access from the countries other than those that belonged to the "old" Commonwealth, the United States, and Europe was severely restricted, because the Liberals, under Mackenzie King and Louis St. Laurent, were not prepared to abolish Canada's racist immigration policy (Knowles, p. 179, 2007).

On January 19, 1962, Ellen Fairclough made inroads in reforming and practically eliminating the White Canada immigration policy (Knowles, 2007). Her changes

> eliminated racial discrimination as a major feature … *as long as* they had the requisite education, skill, or other qualifications were to be considered suitable for admission, irrespective of race, colour, or national origin (Knowles, p. 187, 2007).

However, it should be noted that not all Parliamentarians were happy with the change (Knowles, 2007). In the following years there was a major influx of immigrants from non-European countries. I am proud to say that 14 years to the day of the implementation of this policy, I was born in Canada, the child of immigrants that were allowed into the country thanks to Fairclough's transformations. In 1966, a point system was instituted as a way for immigration officials to formally make decisions regarding immigration applications. The system established

> a fixed maximum in each of nine categories, including education, employment opportunities in Canada, age, the individual's personal characteristics and degree of fluency in English or French … fifty points out of a possible hundred earn a candidate a passing mark (Knowles, p. 195, 2007).

The introduction of the point system eliminated an individual immigration officer's biases from the decision-making. The point system formally became a part of the Immigration Act in 1967. The Act also included a general clause mandating, "the elimination of discrimination based on

nationality or race from all classes of immigrants" (Knowles, p. 199, 2007). As a result of these policy changes, a change in the face of Canada's metropolitan areas was swift.

> The sixties also spawned a change in the restrictive immigration laws to include a point system where immigrants from all over the world had a better chance of admission into Canada. This change has resulted in a much larger influx of immigrants from other non-European parts of the world, including a more heterogeneous inflow which is much more multiethnic, multiracial and multicultural. While in 1971 only about five percent of immigrants were considered visible minorities, by 1991 this had doubled to ten percent, with large numbers entering Canada from Asia, the Caribbean and Africa (Driedger, p.487, 1999).

My father was one such individual, he was one point short of the required 50 points. The immigration officer asked if he knew any French and my father said, "Bonjour." The officer replied, "Welcome to Canada."

With a new Immigration Act in 1978 disavowing any discriminatory practice, the face of immigration in Canada swiftly changed, but a more subtle form of racism continued (Knowles, 2007). Within the context of their study, Krahn, Derwing and Abu-Laban (2003) explain that during the 1990's the government funnelled new immigrants to "second-tier" cities located in the Prairie Provinces. In Alberta that included seven large and small urban areas. This echoed the practice that had been established in Canada's immigration history, in which refugees and many others were funnelled to the Prairie Provinces (Knowles, 2007).

It is interesting to note that with a history steeped in racism, currently the Canadian Prairie provinces are experiencing a record boom in immigration and emigration where

individuals are actively choosing to move to these areas. According to Statistics Canada, Alberta led all provinces in population growth from 2010-2013 (See Appendix D: Census Results Comparison). In recent years, Alberta's average annual population growth has been over 5%, far above the Canadian average. What is also of importance is that this growth has occurred primarily in Alberta's two main metropolitan areas, one of which is Edmonton (Statistics Canada, 2014). Edmonton's core urban demographic composition comprises a higher percentage of Aboriginal residents and a "higher percentage of African, South Asian and Southeast Asian residents than the city-wide average" (City of Edmonton, 2010, p. 4). Logically, the unique structure and nature of the urban core within Edmonton should be reflected in the teaching and learning that is occurring in our classrooms, privileging the "who" and not the "what." As Orr (1992) writes, "the study of place has a significance in re-educating people in the art of living well where they are" (p. 130). The meaning of "living well" differs geographically and culturally, but at its core Orr is discussing the reinhabitation of students. But reinhabitating the colonised spaces within Edmonton's urban core requires an examination and disruption of history and its connection to place, as "decolonization becomes a metaphor for the process of recognizing and dislodging dominant ideas, assumptions and ideologies" (Gruenewald, 2003, p. 71). I contend within the urban environment, decolonisation is not just a recognition of colonialism and ethnocentrism but a move beyond: beyond looking at the place, to the spaces that are found within the colonised sphere of the urban.

2.3-4 Postcolonialism and Urbanity

I found a new way to drive to my parents' house: I go down 95 Street and turn off at either 115 or 118 avenues. I chose this route because I know there are no speed traps and very little traffic. Deciding which road to turn onto is not a conscious decision, rather it depends on whether or not I have paid enough attention to the street numbers. The reason for this lack of attention to the roads is that I am watching the people that I pass — the individuals pushing their shopping carts, those waiting at the food bank, the ones running across the street, the children in the school whose playground is the size of my courtyard. I stop at the Safeway here sometimes, and am always surprised at the presence of the security guard standing at the entrance. This is the area that Edmontonians call the "inner-city." On one of the streets there is a large blackboard set against a fence with a new question every week: "What are you thankful for?" "What do you want to do before you die?" "Thank the Food Bank." While people are searching through garbage cans for bottles, food and cigarettes the children laugh and run. They play with the joy of youth. While the cars pass by, people are writing on the board, sharing their hope and gratitude. While people pass by, those who live here go unnoticed: they are not seen.

As Bruce and Yearly (2006) explain, colonialism is the "rule of one nation, country or society by another" (p. 41). They elaborate further by stating "it now more commonly refers to the domination of large parts of the world by white Christian European states in the 19th and 20th centuries" (p. 41). Polices reflect the society and the time they are produced (Bowe & Ball, 1992) and thus must be placed in context: "context refers to the antecedents and pressures leading to the gestation of a specific policy" (Taylor et al. 1997, p. 45). That is why it was crucial

to understand the history of Canada's immigration policies, to provide a link connecting post-colonialism to colonialism. Colonialism is about many things. It is about the

> history and culture of countries involved in colonial rule, the policies that have been implemented before and after the independence of colonial states, and the personalities and beliefs of rulers and people of influence, both colonizers and colonized (McKinley 2007, p.201).

Canada is a colonial country "where incomers could not displace the indigenous peoples, so undertook to govern them instead" (Moss, p. 37, 2004). Much like other colonised or colonial countries, it is a country that is coming to terms with its heritage, history and "the illusions it has nurtured" (Moss, p. 37, p. 37). As such, in comparison to many other colonial countries, many believe that

> Canada seems newly postcolonial; because it remained a colony during the height of nineteenth-century nation building and imperial expansion, it has a longer and more intense experience of the colonial condition (Bennet, p. 109, 2004).

Post-colonialism is a term that "has been used to describe writing and reading practices grounded in some form of colonial experience occurring outside Europe but as a consequence of European expansion into and exploitation of the 'other' worlds" (Tiffin, p. 170, 1988). From Fanon's (1968) discussion of hegemony and attempts to validate the Other's self-identity, to Said's (1978) concept of Orientalism which goes beyond Fanon's "perspective of concerns of resistance and recovery of colonial modernity to more of a nuanced understanding of the reciprocal relationship between domination, resistance and difference," (Carter 2004, p. 824), postcolonial theory has a long and rich genealogical/historical past, and can be found in a variety of disciplines and fields. Said's (1978) discussion of the "West's" attempt to Orientalize the Other

has created an image of the Orient as an irrational, weak, feminised Other, which contrasted with the rational, strong, masculine West. A contrast he suggests derives from the need to create "difference" between West and East. As Moss (2004) explains "we are not a community in common but a community of difference" (p. 38). O'Brian (2001), building on those before him, focuses on issues of identity and representation in the present-day. Ninnes and Burnett (2001) build on the notion of Other and explain how control of knowledge can be propagated through the school curricula (in particular, the science curriculum) by creating a representation of knowledge and identities within the curricula, and by stereotyping, exaggerating cultural differences and masking diversity. As explained by Ninnes and Burnett (2001), the Orientalization of the Maori people occurred via stereotypes, exaggeration, and exoticism. As explained earlier, I would contend that based on the descriptions and policies of Canada's past, immigrants within Canada were also actively Orientalized. Post-colonial writers attempt to "establish or rehabilitate self against either European appropriation or rejection" (Tiffin, p. 172, 1988), thus postcolonialism cannot be pinned down. What it is, though, is a "point of view that contains within it a basic binarism: it divides our way of thinking about a people in two parts, as colonial opposed to postcolonial" (Bennett, p. 110, 2004). Thus, in referencing postcolonialism in terms of colonialism, what becomes of importance (to me) is how colonial subjects are not only subjugated but, more importantly, can create forms of resistance and break the labels placed upon them.

Education can be the means in which to engrain and reproduce prejudice. This is why, for this study, I believe that the place in which post-colonialism and critical pedagogy intersect within the urban landscape is so vitally important. At its heart, postcolonialism is a "theory of difference" (Lawson, p. 151, 2004) and critical theory is a means to engage how hegemonic

norms influence the perpetuation of the notion of difference, and the result is that a tendency to Otherize becomes more entrenched.

2.3-5 The Cultural Hybrid in the Liminal Space

A people without the knowledge of their past history,
origin and culture is like a tree without roots – Marcus Garvey

I agree with Bhabha (1994) that "we" as a society are balancing on a fine line resulting in a classification of people as "something" or as "not-something" in order to make sense of our world. A colonial means of reinforcing the notion of the Other is through the use of spatialised language, which "has given identity politics rich new metaphors with which to understand and recast social positioning" (Gruenewald, p. 631, 2003b). One such term is the inner city. Exploring the term inner city within the context of colonisation, a binary of inside/outside is recognised. People who are found within the "inner-city" are different than those found "outside" of it. Thus, labels are then placed upon those found on the inside. For example, the youth I have worked with over the years are often labelled as problematic, troubled, lazy as illustrated by Morrison (2007). In turn, these labels create an antagonistic (Bhabha, 1994) relationship, reinforcing an us versus them mentality, a binary that is currently reproduced within the context of urban environments, exemplified by such terms as ghettos, lazy, and welfare babies. However, there is a flip side to this discussion. Moss (2004) contends that the "language of formerly colonized countries is infinitely rich and vital, refreshed by the words and syntax and ways of thinking and feeling of other languages, some of which evolved in these places" (p. 39). This, I believe, further illustrates the urban core as a place of colonisation. Living in the urban core and working with youth who also lived and went to school there, I quickly came to appreciate the

difference in language. For instance, my students would not use the sound "th": rather they replaced it with "f." Thus "three," "there" and "north side" sounded like "free," "fere" and "norf side." The term "younger" referred to adopting a younger student within the school. Walking within the urban core, you hear a language that envelopes you, that is unique and most definitely spatialised. As Gruenewald (2003b) says, "if human experience, identity, and culture are intimate with and inseparable from our relationship with places, places deserve much attention in discussions of education" (Gruenewald, p. 627, 2003b).

Given the educational marginalisation of urban youth, and recognising the urban environment as colony found within the larger Canadian space of the colonial, I contend that the new urban environment is in actuality a liminal space. The liminal space is an area without constraints of binaries, a s/place. Within the s/place, youths that comprise the new urban environment are hybrids, and consequently cannot be placed along a convenient binary – they are not problematic, troubled, lazy, unique or special – they are a mixture of beings as they concurrently occupy a variety of spaces within the liminal. Thus, they are "cultural hybrids" for our current time. For me, these cultural hybrids are not individuals who are only camouflaging within the liminal space (Bhabha, 1994), they are moving freely within it (Roth, 2008), creating a third space which

> constitutes a hybrid space, where the two other cultural forms come to be cobbled together, in a process of moment-to-moment hybridization or creolization that does not follow a plan, a cultural bricolage leading to new forms of culture (p. 903).

I find Roth's (2008) conception of third space confining as it seems to solely be dependent on cultural forms identified via history rather than the larger space of the urban. I acknowledge that history and tradition are essential in understanding one's identity, but by thinking beyond single

narratives I am able to investigate how the urban environment in Edmonton has come to be and how that impacts the youth with whom I worked. I think it is important to look at how particular moments in time frame the youth who live within it: not the why or how, but the now. Urban youth are in a cultural revolution. This is not just an historical issue but also an issue of the current times; youth are negotiating their identities within the construct of the new urban environment. Therefore, it is essential to look beyond the narratives of orginary (Bhabha, 1994) and find the intersubjectivity of the shared meanings found within the communal group: the urban. By looking at intersubjective meanings, one can discover not only how youth define their particular environment, but how they define themselves.

Karanja (2010) discusses how her work allowed her to understand the "(post)-colonial effects on my past and present" (p.3). Consequently, this reflection enabled her to begin to understand her own "internalization and participation" (p. 3) as she began to deconstruct the various colonisation practices in Kenya. She states that it is the "means *of* (my focus) understanding the 'other' in relation to, rather than apart from, oneself, and vice versa" (Karanja, 2010, p.3), which I interpret as a way to break the binary of the researcher and researched, the in and out. Karanja's (2010) crossing of "imaginary and physical boundaries" (p. 3) enabled her to understand the renegotiation of identity of the urban youth she worked with. She was able to see herself as beyond and at the same time within the urban environment, and thus her experience-based methodology was essential to her research. This is vital for me in understanding why I must acknowledge my own bias with regards to post-colonialism. Karjana (2010) examines how the notion of hybridity differs from historical origins and post-colonial meaning. Karanja notes hybridity has transformed from a pejorative term to one used to discuss the benefits accrued from "the straddling of two cultures and the subsequent ability to negotiate the difference" (p.4). As

such, hybridity can be used as a theoretical lens for "understanding diversity, multiplicity and conflicting perspectives" (p. 4). For me, the dominant group that has labelled the urban as lazy, poor and troubled does not necessarily understand the true identity of urban youth as engaging, energetic and intelligent. Furthermore, by utilising hybridity as a central concept within my work, I hope to demonstrate how urban youth's identification and self-identity is fluid and not fixed. Additionally, by employing the notion of hybridity, I am able to aid my research participants in rethinking and re-evaluating their position. This is essential for my work as a critical pedagogue, as the "primary value of place-based education lies in the way that it serves to strengthen children's connections to others and to the regions in which they live" (Gruenewald, p. 645, 245). By thinking of those who work or live in an urban environment as cultural hybrids, I was able to create and negotiate a third space. What this space looked like differs depending on those who occupy it. Post-colonialism grapples with problems of identity and representation in the contemporary era; it identifies the complicated process of establishing an identity that is different from, yet influenced by, the dominant Western culture in which most children are taught (Chahal & Harding, 2011; O'Brian, 2001). In order for my participants to move beyond the binary identification and labels placed on them, a liminal space had to be created that allowed for the participants' new hybrid identities in the new urban environment to be discussed and explored. In order to ensure this, I created a space for my student participants to speak freely and openly, promoting inclusion rather than exclusion.

The focus of my research was the participants and how they began to take ownership of their learning. Science was the context that enabled me to do this, due to the fact that I am a science teacher and therefore feel most comfortable facilitating conversations about/around

science. Additionally, the term “science,” like the term “urban,” is fraught with colonial and Western hegemonic norms thus providing a rich platform for exploration.

Chapter 3: The Subject

Science

I do not remember learning anything "scientific" in elementary school. In junior high, all I remember is sitting at my desk (a circular lab bench) while being told how to dissect a frog and being disgusted. In high school, I remember my mother telling me that I had to take chemistry, biology and physics and hating it, but doing well. Then, in university I ended up in a conservation degree program and was once again forced to take a variety of science courses, which I didn't do too well in. That changed with botany and my actual conservation courses. I then entered the Faculty of Education and, lucky me, my major became biology (those darned botany classes!). My apathy towards science changed when I became a teacher. In trying to create engaging classes for my students I fell in love with science. Science was no longer something that I had to learn. It became a passion that I wanted to share with my students. I realised that in making it fun and engaging for them, I was also inspired. Science is not just a subject: it explains everything about the world around us, and this is what I want my students to realise.

Science is just boring to me … I don't think it's science we hate. I hate it mostly because we make it boring – Tara (12- research participant)

From Galileo to Bacon, to Darwin, the push for metaphysics meant that the guiding epistemology of the "new" world was one of observation, dissection, and analysis. It was during the 19th century that "primacy of scientific knowledge above other ways became a modern, public belief" (Blades, 1997, p. 17), continuing into the modern day. During the 20th century the world became engrossed in geo-political competitions exemplified by the Great Space Race. In

North America, a focus on science education ensued (Blades, 1997). It was at this time that the importance of the science curricula was established, influenced by politicians, industrialists and scientific experts, and the "traditional" scientific method took precedence within schools. Through the processes of physical and intellectual colonisation, Western notions of science education have been globalised and normalised (Nandy, 1988; Shiza, 2011).

According to Carter (2008) "[g]lobalization refers to the recent transformations of capital, labour, markets, communications, scientific and technological innovations, and ideas stretching out across the globe" (p. 618). Brown & Lauder (1996) contend that the creation of the "global economy" (p.47) has led to a reformation of the relationship between state and individuals. The backbone of this reformation is the ideology of neo-liberalism, which is synonymous with capitalism (Carter, 2008). Institutions such as the World Bank and trans-national companies "both discursively and structurally determine the way in which many domains, including those of scientific research and education can now exist worldwide" (Cater, 2008, p. 620) – resulting in "changes in the rules of eligibility (Brown & Lauder, p. 48, 1996). Meaning, that all individuals are either a part of the new world economy via inclusion or exclusion (Carter, 2008). The changes in eligibility of individuals into the global market has resulted in changes in how science research and teaching is conducted because"[n]ot only has the 'education' component been gradually restructured by a number of factors including the dominance of supranational entities and ideologies, 'science' too, is changing as a consequence of globalism' (Carter, 2005, p. 629)

3.1 The Episteme of Science

The episteme of science is that of an objective, technologically driven educational system that was formulated during the 18th and 19th centuries. Thus, science could be described as the phenomenon of organising an epistemological way of knowing and framing the world, thereby denying other approaches to knowing – colonisation in action. Consequently, the creation of boundaries around the subject of science has given science power as a form of codified knowledge (Gieryn, 1983), referred to as scientism. Scientism is the belief that the scientific method and its approach are universal, and that the empiricism that seems to encompass the field of science is fundamental and other viewpoints or forms of knowledge are negated. Globalisation has allowed the traditional Western/European episteme of scientism as knowledge to be propagated worldwide, in order to create the technology needed for our global economy and thus the influence of scientism within science education is codified in such a manner that the focus of science education becomes job preparation.

This occurs because students become constructed via the discourse of neo-liberalism (Leathwood & O'Connell, 2003) and codified through scientism; the motivation for this codification lies in the belief in the material benefits of a knowledge economy. The knowledge economy is the backbone of policy reform and as it becomes increasingly important in the new global world, people (students) become the new capital (Becker, 2006; Taylor, 2004), referred to as human capital. Thus, an investment in science education is required in order to create a nation-state that is able to compete within the global economy, connecting scientism to globalization. Alberta Education (2003) explains it this way:

> Students graduating from Alberta schools require the scientific and related technological knowledge and skills that will enable them to understand and interpret their world and become productive members of society (p. 1).

The significance of science education to the national economy is further reinforced by institutions such as the World Bank, which reported that learning science is "considered important for the global economy" (Spring, 2009, p. 46) due to achievements in "broad-based science literacy" (Spring, 2009, p. 47). According to Alberta Education (2003), to be "scientifically literate, students must develop a thorough knowledge of science and its relationship to technologies and society" (p. 1). Resulting, in many countries "making either new or renewed efforts to set higher standards for student learning outcomes so they will not be left behind in that global competition" (DeBoer, 2011, p. 568). This trend in increasing learning outcomes in science "is motivated by international comparisons of students' performance on science assessments, combined with the belief that the economic well-being of a nation state is related to its educational success, especially in technical fields" (DeBoer, 2011, p. 568). Consequently, dictating that the skills required by today's students are far different than those required of students' 20 years ago (Gleeson, 1996). In particular, science education in an era of globalisation privileges and disseminates an episteme of traditional science (scientism) as a means for employment preparation. Thus, lacking scientific literacy means that one will not be able to partake in the economic benefits to be achieved in a technologically oriented global world. However, according to Calabrese-Barton (2003), the focus on scientific literacy does not account for differences in accessibility. Instead, a focus develops on a deficit model of science, in which the focal point is what is being taught rather than who is being taught, a return to the Freirean banking model of education.

3.2 The Blame Game

Critical pedagogy is inherently opposed to education being treated as a prize given out to those who "toe the line." According to this conformist, reproductive approach to education, those students who behave in a manner that is deemed inappropriate or unacceptable are not "rewarded" with the benefits of an education; instead they are marginalised and eventually lost. These marginalised, lost students were the at-promise youth I aimed to work with. Meritocracy gives credence to the notion that all students have equal access to cultural, social and economic capital and that class is not an issue (Bourdieu, 2006), which leads to a focus on the emergent middle class as the norm. According to Taylor and Woollard (2003), many school systems are based on the desires of middle-class parents, as "state schooling is being recaptured and reworked by the needs, real or perceived, of the middle-class" (Ball 2003, p. 146). However, as Skeggs (1997) says there is no classlessness in education,

> class culture is not a neutral pattern (sic) It compromises experiences, relationships, and ensembles of systematic types of relationships which not only set particular "choices" and '"decisions" at particular times (Willis, 1981, p. 1).

Thus, one's cultural, social and economic capital is greatly affected by time and opportunity. As Apple (2001) states, "we are witnessing a process in which the state shifts the blame for the very evident inequalities in access and outcome it has promised to reduce, from itself onto individual schools, parents and children" (p. 474). The urban educational environment is segregated via class and culture. Rather than questioning why particular children are not succeeding, society blames their apparent failure directly on teachers, parents and the children themselves. This shifting of blame is exemplified by United States President Barack Obama in his 2014 State of the Union address: "We cannot improve education without more demanding parents" (New York

Times, 2014, para. 1). Blame is no longer placed on the restrictions within the educational milieu. Consequently, the issue "that children attending high-poverty, urban schools have reduced access to new textbooks, scientific equipment, and science-related extracurricular activities" (Calabrese, 2003, p. 24) is not addressed. As Apple (2001) highlights, "inequalities in access and outcome" (p. 474) are what actually prevent success for students'. However, blame is not placed on the educational system but rather with those lacking merit. It is understood that student learning is impacted by emotions (Randler et al., 2011). A 2015 search of peer reviewed publications in the educational research database ERIC using "science" AND "boredom" as descriptors revealed only 50 publications between 1964 and 2015. Illustrating that the connection between science education and boredom is not new. Jenkins (2006) refers to a 2005 survey conducted in England in which over 51% of students surveyed 'referred to their school science as boring' (p.9). As discussed by (Behrendt, 2001) there are a variety of aspects of learning science that effected student enjoyment. The overwhelmingly predominate reason that effected students lack of enjoyment in science was boredom (Behrendt, 2001). Boredom according to Behrendt (2001) was connected to writing and teaching styles that reflected a more passive approach to student learning. Generally, boredom directly affects students' performance and enjoyment in their science classes. However, the blame game is placed on the students' lack of interest and merit rather than on teacher style. When considering boredom with regards to at-promise inner city youth other factors are at play.

3.3 Re-thinking Science through a Critical Lens

As Calabrese (2003) notes, current approaches to science education do not account for urban children in poverty and the influence of "social, cultural, political, and economic environments" (p. 5) and thus she asks some vital questions.

1. How do high-poverty, urban youth construct a practice of science in their lives in ways that are enriching, empowering, and transformative?
2. In what ways does their practice of science intersect with the issues that frame their lives?
3. How might the science teaching practice we construct formally (in school and out of school) with young people in urban poverty reflect their lives, their concerns, and their practices of science? (Calabrese, 2003, p. 5)

While these questions relate to my research objective, question 1 connecting to reinhabitation, question 2 to the relevance of pedagogy of place and question 3 to the role of power and transformation, Calabrese's research approach differs quite dramatically from my own. Calabrese's research approach differs quite dramatically from my own. Calabrese interviews and shares stories from the urban youth she works with, focusing on their dreams and hopes. I agree with Calabrese (2003) that there exists a gap between what urban youth bring to school and how those in "powerful positions (teachers, researchers, and policy makers) neglect to see those strengths because of an overt attention to youth's deficits ... in science education" (p. 24). If science education is considered a necessary subject to increase a nation's prosperity and if, as the research highlights (Calabrese 2003, Gruenewald 2003b), children living in urban cores are not succeeding, then "some of the brightest and most creative young people are lost in the process, because they cannot fit in or refuse to fit in" (Loy, 2008, p. 111). As Calabrese (2003) illustrates, many science courses in urban areas focus on the students' deficits. "Children whose race, gender, ethnicity, language, culture, or class, position them outside the borders of mainstream of science or society" (Maulucci, 2010, p. 840) are at a greater disadvantage. Furthermore, in urban classes, youth "spend more time reading from textbooks and completing worksheets and are

expected to be passive learners rather than active users and producers of disciplinary knowledge" (Calabrese, 2003, p. 25). This traditional approach to science education was most definitely the case with my youthful participants and it is this approach that Behrendt (2001) discusses as the passive teaching style that impacts students' enjoyment of their science education. While this is true for students across learning environments, the fact that students in urban environments are more likely to lack resources (scientific equipment, computers etc.) lends to teachers utilizing the more passive pedagogical style of worksheets and rote learning. When queried about their science classes, the at-promise youth all commented that within their science classes they mostly read. This resulted in a feeling of passive learning "in my opinion because [the teacher] usually, like, makes us take notes and then we just get a project without much explanation" (Iham, 12-research participant). Like the students mentioned by Behrendt (2006), Jenkins (2006) and Randler et al. (2011) these traditional approaches led the students to feel bored in (and with) science; the phrase "boring" was used 14 times during a student discussion about science. In addition to conversations, I conducted a brief survey with the students (the exact methodology will be discussed in detail in the methodology chapter) and a final open-ended questionnaire. More than half of the survey respondents said that they disagreed with the statement "I can use what I learn in science in my life outside of school," illustrating the gap that exists between what they have learned and their ability to apply it to "real-world" situations. Scientific literacy is the knowledge and understanding of scientific concepts required for personal decision making. But when questioned, students did not see the relevance of science to their lives, illustrating the lack of understanding of the role science plays in both society and culture. According to Edwards (2011) "scientific knowledge is constructed through social interaction with others in a co-operative learning environment" (p. 102). Thus, for true scientific education to occur in an

environment where unequal distribution of social capital is the norm, relevant pedagogy must be created, in which discussion, equity and collaboration are paramount. This is far more than a mere restructuring of the school environment. As Yatta Kanu (2008) states, "the responsibility of achieving educational equity for ethnically, racially and culturally diverse students cannot be relegated to only one dimension of the educational enterprise" (p. 140). A decolonised classroom provides the opportunity for "both learners and teachers to engage in critical discussion" (Adjei & Dei, p.180, 2008). In order for such an environment to exist, an acknowledgement of local identities is necessary. Such an acknowledgement would make it possible to avoid the duality created between the local and the global with regards to science education. The neo-liberal discourse surrounding science requires scientific literacy skills for the global economy, however if students are unable to relate to science at the local level, how will they understand its role in the grander scale?

Chapter 4: Methodology

Constructivist Grounded Theory

Imagination is the highest form of research – Albert Einstein

As Corbin and Holt (2005) state, "it is difficult to imagine building a practice that is not based on theoretical knowledge" (p. 49), because theories are able to provide schemes of guidance for educators. Grounded theory as a methodology provides an "understanding about how persons … experience and respond to events" (Corbin & Holt, 2005, p. 49). Grounded theory provides the researcher the opportunity to "collect data to develop theoretical analysis from the beginning of a project *in order* (my emphasis) to learn what occurs in the research setting … what are research participants' lives are (sic) like" (Charmaz, 2006, p. 2). Consequently, the use of grounded theory was vital for my own research, where my focus was not the subject-specific curricular content but rather the intersection of life as an urban dweller and formal education within the context of one subject – science. Grounded theory provided me with the opportunity to analyse the data in a unique and flexible fashion which enabled me to undertake an "original analysis" (Charmaz, 2006, p. 2) of the data. The guidelines provided by grounded theory (Charmaz, 2003; 2006; Corbin & Holt, 2005; Mills et al, 2006a) were of particular importance with regards to the many focus group discussions with my participants. The guidelines enabled me to investigate the statements and actions of the students in detail, yet respect their voices.

I have chosen to utilise a constructivist grounded theory (C.G.T) methodology as it "encourages innovation: researchers can develop new understandings and novel theoretical interpretations of studied life" (Charmaz, p. 398, 2008b). In utilising C.G.T, Charmaz (2008b)

advocates examining the researcher's relativity, reflexivity and representations of social constructions with regards to the field of study. Thus, my objective in discussing my background, biases and purpose with regards to my chosen study, are the first steps in C.G.T research, as it lends to understand the researchers' own understandings and perspective. According to Charmaz (2008b), C.G.T explores "what and how questions" (p. 398), which build the foundation of the C.G.T approach. Generally speaking, Charmaz's (2008b) constructionist approach makes the following assumptions:

1. Reality is multiple, processual and constructed – but constructed under particular conditions.
2. The research process emerges from interaction.
3. It takes into account the positionality of the researchers, as well as the research participants.
4. The research and researcher co-construct the data – data are a product of the research process, not simply observed objects of it (p. 402).

From a C.G.T perspective, objectivity is questionable, as what is defined as objective does in actuality reflect someone's perspective and/or position. So, C.G.T does not "assume that the theory emerges from the data" but rather "that researchers construct categories of the data" (Charmaz, p. 402, 2008b). Context is central. Thus, "constructionists aim for an interpretive understanding of the studied phenomenon" and "participants views and voices *are* (my emphasis) integral to the analysis – and its presentation" (Charmaz, p. 402, 2008b). It is essential in the C.G.T process that researchers analyse "how their research participants construct their lives" (Charmaz, p. 403, 2008b; 2006). There are certain structures and processes upon which C.G.T rests:

- Treat the research process itself as a social construction.
- Scrutinize research decisions and directions.
- Improvise methodological and analytic strategies throughout the research process.
- Collect sufficient data to discern and document how research participants construct their lives and worlds (Charmaz, p. 403, 2008b).

As the work is emergent, there are no set rules of what "a researcher needs to do and when he or she needs to do it" (Charmaz, p. 403, 2008b). However, there are some rough guidelines. First, the researcher "does not stand outside the studied process but is a part of it" (Charmaz, p. 403, 2008b), perhaps providing detailed constructionist stories in which the researcher places himself/herself and her "multiple positions" and situations. In addition, the researcher should acknowledge his/her "starting points and continued immersion in this world as a social actor" (Charmaz, p. 407, 2008b). However, it is important to note that "starting points frame but do not determine the context of constructionist grounded theory" (Charmaz, p. 403, 2008b). According to the tenets of C.G.T, in analysing the data the researcher could include:

1. Attention to context.
2. Allocating of actors, situations, and actions.
3. The assumption of multiple realities, and
4. The subjectivity of the researcher (Charmaz, p. 408, 2008b).

To further understand C.G.T, it is important to discuss how it differs from Grounded Theory and the central role of the concept of emergence.

4.1 The Critics

Science must begin with myths, and with the criticism of myths. - Karl Popper

Grounded theory as a methodology has its critics and own set of unique challenges. For example, it is understood that within the traditional modes of grounded theory, the metaphors and idioms created represent the participants' - it is not the participants' words or thoughts being discussed. Historically, grounded theory is more interested in analysis of the data and not the portrayal of the subjects (Charmaz, 2003). Glaser and Strauss (1967) wanted to prevent the researcher from becoming submerged in the world of anecdotes and stories so as to avoid becoming biased toward the participants' viewpoints, and overwhelmed by the amount of data. They wanted the researcher to create a way to effectively organise and understand the data. Grounded theory's strengths lie in providing the researcher with direct guidance regarding analysis (coding) and with the opportunity to continuously self-correct and double-check (sampling, journaling). While the strengths of grounded theory are why I have chosen it as my methodology, a major criticism of the method is the relationship between the participant(s) and researcher. Grounded theory separates the viewer from the viewed, thus creating a barrier; it separates the participant's meaning from what is written (not necessarily created) and, hence, a representation of the participant(s) is fashioned. Grounded theory, at its essence, "reduces understanding ... curtails representation of both the social world and the subjective experience ... relies on the viewer's authority as expert ... is objectivist" (Charmaz, 2003, p. 269). As explained by Star (2007), grounded theory is ensconced in the division between interpretation and reality: "interpretation is poetry. Reality is science. They are meant to be kept apart. Putting them

together is asking for trouble" (p. 88), yet by keeping them apart the participant(s)/research relationship never becomes more than an archaeological analysis of the participant behind the "glass," with the expert watching and uncovering the "truth." For this reason, I chose to work not with the traditional grounded theory method, but with constructivist grounded theory (C.G.T).

C.G.T differs from grounded theory by addressing the above criticism. Charmaz, as the foremother of C.G.T, takes Strauss and Glaser's traditional model and "celebrates first-hand knowledge" (Charmaz, 2003, p. 250). Charmaz (2003) believes that to understand people it is best to see them in their natural environments. Thus for me it was essential to focus on the students within the environment of school and urban. Charmaz redirects qualitative research away from the positivism that was advocated by Glaser, Strauss and Corbin. Charmaz (2003) states that C.G.T "assumes that people create and maintain meaningful worlds through dialectical processes of conferring meanings on their realities and acting within them" (p. 269). Thus, for her, reality is not independent from action and cannot be treated as such. Charmaz (2003) argues that,

> grounded theory strategies need not be rigid or prescriptive. That a focus on meaning while using grounded theory furthers, rather than limits, interpretive understanding and *one* can adopt grounded theory strategies without embracing the positivist leanings of earlier proponents of grounded theory (p. 251).

Consequently Charmaz's C.G.T addresses my own personal philosophical underpinnings. I do not believe that complete objectivism is possible, nor do I believe in a positivistic research philosophy. Education is about people and without some immersion into the field, without the creation of a genuine relationship, the researcher is distanced from the researched, creating a situation in which the "truth" and "meaning" may be lost. Personally, I have chosen to study

urban youth due to my own history and experiences. Bias is foreseeable and will aid in my interpretive understanding. Thus, through C.G.T, I was able to research "without assuming the existence of unidimensional external reality" (Charmaz, 2003, p. 270).

C.G.T differs from grounded theory in providing an alternative perspective on truth, and that reality is observable. I define reality as how students specifically relate to their world, studies, and education and, in this particular instance, how they relate to science (Chahal, 2011). Due to my belief in the construction of reality, a traditional grounded theory approach did not work for me. Grounded theory does state that there is no "pre-existing reality out there" (Strauss & Corbin, 1994, p. 279) but instead "truth is enacted" (p. 279) and thus observable. However, I believe that if a singular truth can be observed by a variety of researchers, there is an implication that a singular reality exists. C.G.T acknowledges my relativist "ontological position" (Mills, Bonner & Francis, 2006a, p. 2) that the formation of knowledge is an active process that changes according to one's social influences and contexts. Consequently, knowledge and reality are not objective. C.G.T acknowledges that differing realities exist and, as such, knowledge itself is vast (Charmaz, 2003). The traditional grounded theory method, as supported by Glaser, Strauss and Corbin, does not acknowledge or account for this type of knowledge creation. For me, reality is a construction of individual experience and understanding. For each of my participants, individual reality is constructed and observed through individual lenses that are formed through their individual experiences: truth itself becomes relative. Reality is constructed and knowledge differs. What I attempted to do is create a space within the context of my research in which I was able to discover my participants' definitions and descriptions of reality, thereby allowing me to create an environment in which the students participating were able to create their own simulacrums of learning.

Glaser believes that it is the researcher's duty to observe the data and report on it (Charmaz, 2003; Corbin & Holt, 2005, Glaser & Strauss, 1967). I am an interpretative individual and believe, as Charmaz (2003; 2006; 2008) does, that "discovered" reality is an interactive process that is affected by the participants' "temporal, cultural and structural contexts" (Charmaz, 2003, p. 273). My participants are challenged socio-economically and defined colloquially as marginalised, I define them as at-promise. I believe that their individual realities are impacted by their lives in the urban setting (structure and culture) in the 21st century (temporal). By constructing a relationship between myself and the participants, an atmosphere was created in which sharing of thoughts and ideas was promoted. As a critical pedagogue creating an egalitarian atmosphere, I used "consciousness-raising questions ... in order to provoke thinking about the power differentials" (Mills et al., 2006a, p. 10). Reflexivity was the method necessary to create consciousness-raising questions (Charmaz, 2003; Corbin & Holt 2005; Mills et al., 2006a; 2006b). I interpreted Charmaz (2006) definition of reflexivity to mean an awareness of the research experience, decisions, and interpretations in ways that brings me into the process. Allowing the reader to assess how and to what extent my interests, positions, and assumptions influenced the inquiry. Constructivism emphasises the subjective interrelationship between researcher and participant. Thus, throughout my discussion it must be understood that my own perspective and biases (critical pedagogy, postcolonial) influence "the questions that are raised and the take on analysis" (Corbin & Holt, 2005, p. 49) of my data.

4.2 Emerging

My ideas have undergone a process of emergence by emergency. When they are needed badly enough, they are accepted – R. Buckminster Fuller

At its heart "grounded theory is a method of explication and emergence" (Charmaz, 2008, p. 156). However, within the grounded theory field, the concept of what is emergent is contested. Generally, emergent methods are well suited for studying something uncharted or dynamic (Charmaz, 2008). When preparing for my candidacy I believed this to be true of my own research. To be emergent or new does not mean that a new idea must be discovered or worked through; within the social sciences this is almost impossible. Rather, emergence is about discovering new properties and phenomena, discovering new intersections and connections about a subject. Therefore, for me, this has meant creating a new emergent study based on past scientific studies/literature: for instance, building upon the work of Barton et. al. (2008) on urban girls and the work of Roth's (2008) on hybridity. While the concept of emergence may be a contested one, what is of importance, as stressed by Glaser (1967), is that a theory emerges from the data; the theory is not forced.

According to Charmaz (2008), "the concept of emergence assumes epistemological understandings of a theory of time" (157). Thus, if emergence is an issue of time, a notion without a past about the present, implying a future corresponds with my desire to create a theory that may fulfil students yet to be. Students dealing with reality as it exists in the present and as it impacts their futures. Furthermore, emergence allows for the unexpected, and when working with people, the unexpected should always be expected. Since emergent theories are about the unexpected and the unknown, and created by one's intuition and experience, the assumption of objectivity is falsified. Emergence at its roots negates objectivity and, thus, the traditional

grounded theory methodology. Glaser, Strauss and Corbin differed in their beliefs regarding emergence. Strauss and Corbin applied specific techniques to data coding and theory generation Glaser firmly believed that the theory emerged from the data, while Strauss and Corbin believed that the theory had to be pulled from the data. I do believe that Strauss and Corbin's contribution is helpful as it provides guidance for a novice constructivist grounded theorist. However, the wonderful nature of grounded theory is that it allows for flexibility. Researchers do not have to strictly follow the Strauss and Corbin system of axial coding or conditional matrix application. For a constructivist, the research emerges not only from the participants but from time, situation, place, social conditions and interactions (Charmaz, 2008). Thus, the research connects together the present time, the locale of the school and the conditions surrounding living in an urban environment. C.G.T. has given me the freedom to discover "issues of importance to participants that emerge from the stories that they tell" (Mills et al., 2006a, p. 3) because "the method does not stand outside of the research process, it resides within it" (Charmaz, 2008, p. 160). Thus, the stories the students tell become the foundation for everything, as the stories lend to inductive or abductive strategies of theory development. Inductive reasoning begins with specific yet limited observations, leading to the development of middle-range theories (Charmaz, 2008b). A full set of data provides the opportunity for generalized conclusions and the possibility for theory building. There is a move from the specific to the general. Abductive reasoning (Glaser, 1967) is when an individual goes from an observation to the hypothesis that accounts for the observations. The hypothesis created regarding the multiple forms of observations leads to theory generation. Theory is the best explanation for the situation at hand. However, this explanation is not always guaranteed, nor is it always complete, as situations vary.

In summary, I used C.G.T for its non-positivistic leanings, because context is central, includes my biases and perspectives, the belief that reality is constructed, and the work is emergent. Utilising C.G.T. I used a case study approach. The case study was based on in-depth focus group discussions.

Chapter 5: The Approach

The Study, Case, Details and Weaknesses

Unless someone like you cares a whole awful lot, nothing is going to get better.
It's not. - Dr. Seuss

5.1 The Study

In my research I used a case study approach. I chose this method of data collection because it allowed me to study my subject(s) in depth, and also focus on the questions. Also, a case study allowed me to "engage with ... the complexity of social activity in order to present the meanings the individual social actors bring to *the* (my emphasis) setting" (Stark & Torrance, 2005, p. 33). A case study approach acknowledges that meanings are created and so is reality, making the approach particularly suitable for a constructivist grounded theory (C.G.T) methodology.

The case study approach has numerous strengths (Stark & Torrance, 2005). First, it provides the ability for the researcher to analyse an instance of action (action codes). It also often requires the researcher to use multiple methods and data sources. Case studies also have the advantage of yielding rich descriptions. Case studies lend themselves to a constructivist grounded theory approach as they eventually lead to a theory of, for and about practice and are about "**process** of inquiry about the case and the **product** of that inquiry" (my emphasis, Stake, 2003, p. 136). By focusing on both the process and product, I was able to enquire about the process by which the students began to construct their thoughts. Finally, the case study method/technique is ideal for use within a C.G.T methodology, as it is based in and on experience. It provides the researchers with experience of the case; it allows them to not only

understand what happened but to generate their own thoughts and knowledge about the subject at hand. Ultimately, it is based on the notion that knowledge is constructed and, as Stake (2003) succinctly summarises, "case study researchers assist readers in the construction of knowledge" (p. 146). As the purpose of my study was to explain the experiences, construction of knowledge and reality of the youths, a case study approach within C.G.T was the best approach, faithfully preserving the integrity of the participants' construction of knowledge.

5.2 The Case

My case study was a combination of an intrinsic and instrumental case (Stake, 2003). An intrinsic case study is adopted when the researcher would like a deeper comprehension of a particular case, noting the particularities as well as the ordinary – but the ultimate goal is not to build a theory (Stake, 2003). Similar to an intrinsic case study, an instrumental case study observes the ordinary but with a different purpose: that of extrinsically creating generalisation(s) (Stake, 2003). The purpose of C.G.T is to create a general theory about a particular situation (instrumental case study). However, in doing this, I required a profound understanding of the youths' perspective in the urban setting (intrinsic case study). As Stake (2003) asserts, many researchers do not think that the intrinsic nature of educational research is important. But, to me, education is about the moments, moments found in the classroom, school or community. In order to understand these moments I had to employ both an intrinsic and instrumental case study approach. As described by Stake (2003), a case is a "specific One" (p. 135), and using Stake's (2003) guide for a qualitative case study researcher, I have organised work along the following lines:

a) Bounding the case, conceptualising the object of study:

I worked with Grade Eight students within one school setting. The markers for the selection of the school were: the ethnic make-up of the school and the socio-economic status of students and families. Utilising these markers, I then provided the school board with a list of potential schools. One school came forward as interested in the work. The goal was that the students would recognise that they were not chosen based on a predetermined selection criteria, nor on some arbitrary measure of ability. My study was not about performance, but rather a situational and contextual understanding of learning.

The focus group consisted of six students from Grade Eight (a group I describe as the "Super-Six") selected by the school principal and class teacher. These students were deemed by the school principal and the class teacher to be underachieving and disinterested in science. The students were all from the same class. As the students were from the same class, they were at the same point in the curriculum. Lastly, I focused on Grade Eight students because in my experience, students in this grade are more open to dialogue and conversation than older students. This proved to be true, leading to interesting and meaningful conversations.

b) Selecting the phenomena, theme, or issues to emphasise:

I chose to examine the phenomena of science education in urban secondary schools. The question I chose to explore was:

How can pedagogy of s/place enable students to use their liminal space within the urban environment to critically engage with their science education?

Understanding that within my work, pedagogy of place is the local environment, the connection I chose to explore was the one between what the students are learning and where they lived (exist). Within this context, it became apparent that I had to address issues such as colonisation, power and unequal capital distribution. Furthermore, because the liminal space is directly connected to the notion of cultural hybridity, students within the urban environment comprised a liminal space or, as Roth (2008) discusses, a third space within the grander city. This space is unique with regards to its culture and physical properties, as those that live within this space are distinctive. They have distinctive identities as a result of their unique realities and as such are hybrids moving fluidly through the liminal space of the urban.

c) Seeking patterns of data to develop issues and selecting alternative interpretations to pursue:

The theoretical responsibility for creating a case with the above attributes lies within the constructivist grounded theory methodology, and was therefore accounted for.

5.3 The Details

At the outset of the research, my intention was to have a parent/guardian introductory meeting to answer all questions they would have prior to the collection of data. However, this did not happen because the teacher preferred to send letters home to the parents. The letter explained the work and presented the parents/guardians the opportunity to contact me at any point. The objective of the study (as explained to the parents and students) was for the students to create their own science lesson(s) on the relevant unit. After each meeting with the students I wrote field notes, to record not only my direct observations, but also my feelings and biases. As

Charmaz (2003) highlights, observations are sites for exploration, and as my research was focused on s/place (relationships and place), observations were of the utmost importance. The student meetings were progressive in nature, meaning that each built from the one previous. As such, the first gathering was very different from the last meeting. I was able to begin my research by working with the students on a new unit – Freshwater and Saltwater Systems (Alberta Education, 2003). This was ideal, as the students were joining the group as equals, drawing on past experiences, thus lending to a co-teaching possibility (Roth & Tobin, 2005). We met once a week from April to June 2013. The first meeting lasted 45 minutes and was a discussion of students' perceptions of science and the importance of water in their lives. Over the course of my research, the data collected was in the form of field notes, a survey, audio-recordings, an environmental scan, student artefacts and a questionnaire.

I conducted seven meetings over the course of the 3 months. As my participant group were youth, it was necessary to do some preliminary research into how to conduct conversations with adolescents. As a critical pedagogue, talking with these children was of the utmost importance. I did not want to speak for them: rather, I wanted to provide them with the opportunity "to give voice to their own interpretations and thoughts rather than rely solely on our adult interpretations of their lives" (Eder & Fingerson, 2003, p. 33). I wanted to explore the lives of these youth, their reality, and understand if it was possible for them to create their own science lessons. Without the direct discussion with these students that took place over the course of the research, my work would have been merely a conjecture of what they thought. It would not have reflected the true possibilities of how the students themselves created change. When working with children, I had to be aware of the inherent power dynamics between adults (researcher) and youth (researched) (Eder & Fingerson, 2003). In general "children are a socially disadvantaged

and disempowered group, not only because of their age but because of their position in society as the "researched" and never the "researcher" (Eder & Fingerson, 2003, p. 34) Collaborating with the students made them co-creators and co-interviewers: they became both researched and researcher.

This is also why I decided to work with the students in groups rather than as individuals; as noted by Eder and Fingerson (2003), working with youth in groups aids in creating a more natural setting for the focus group process and thus an enjoyable experience for both researcher and students. Another asset of focus group discussions is the understanding that, as youth, children "construct their meaning actively with their peers" (Eder & Fingerson, 2003, p. 35) and this most definitely happened. However, a drawback of interviewing Grade Eight students in a group was control; students at this age are apt to get off topic and require gentle guidance to return to the topic at hand. Each meeting consisted of a question period. Meetings two-five included work time for projects. My meetings with the students were constructed as a focus group, not as a group interview. The reason for this distinction lies in how conversations were elicited. Our focus group discussions (the phrase focus group discussions shall be used interchangeably with focus group) were "organized to explore a particular set of issues" (Kitzinger, 2005, p. 56) based on the collective activity of the students' creating their own lab/game/demo. My focus in the meetings was the interaction between the students and my goal was to generate discussion on the topic of their science education (Kitzinger, 1994). As the mediator within the focus group discussions, I at times asked different types of questions (probing, direct and open-ended). I kept my questions general and unstructured in order to elicit a democratic process (Eder & Fingerson, 2003). The questions in later meetings were designed to provoke an understanding of how students compared science and their learning to other subjects

and grades. Undertaking a C.G.T approach (unlike the traditional systematic grounded theory approach) meant including an emphasis on "diverse local worlds, multiple realities, and the complexities of particular world views and actions" (Creswell, 2006, p. 65).

According to Charmaz (2006), C.G.T. is based on an interpretative approach with flexible guidelines: "a constructionist approach offers an open-ended and flexible means of studying both fluid interactive processes and more stable social structures" (Charmaz, p. 1162, 1990). Utilising an interpretive approach with flexible guidelines meant that the theory developed was dependent on my views, and on the participants' experiences regarding such topics as power, relationships and situations. Using Charmaz's conception of C.G.T. my focus group questions were attempts to discover the students' views, values, beliefs, feelings, assumptions and ideologies. Among the questions I asked were:

- Have any of you felt that the science that you've learned is important to who you are?
- What was the purpose of creating your own activities?
- Was water more interesting?
- Did it matter more that you got to pick what you wanted to do? You found the question, you did everything? Why?

At certain points I was more of a facilitator, guiding the conversation and listening while observing the dynamics of the students and how they created their projects. During the second meeting I surveyed the students.

According to Charmaz (1990) "[b]y starting the data from the lived experience of the research participants, the research can, from the beginning, attend to how they construct their worlds" (p. 1162). As I was unacquainted with the students prior to our first meeting, and did not

want to this hinder my understanding of their lived experiences from the beginning of the research, I created a survey. The survey provided me with the opportunity to understand the students' perception of science class, importance of science to their lives and who they are as individuals. Hence their individual constructions of their worlds. The survey took half an hour to complete (much longer than I planned) but it provided valuable information regarding the students' perceptions of their neighbourhood and school environment. The survey consisted of 28 multiple choice questions that were divided into three categories: general information, skipping school and learning styles. The survey included Likert Scale response questions as well as two general questions and three open-ended questions. The open-ended questions were:

1. How do you define the inner city in Edmonton?
2. Think of the best science lesson you have had. What made it a great lesson?
3. What would you like to see in your science class to make it better connected to your life outside of school? (see Appendix G: Student Survey)

Upon hindsight, I should have kept the same format for the survey questions. The reason I had so many multiple choice questions was to aid in the survey's simplicity while also not allowing reading or comprehension to impact the students' answers. This turned out to be the right decision. I was present when the survey was conducted so the students could ask for clarification. One student, due to personal issues, did not attend two meetings. However, he was a valued member of the group and has been included in the overall data analysis.

Coming into the meetings, I understood the power dynamics involved when researching. These dynamics included that I was a middle-class researcher, former teacher and adult female. To aid in the creation of an egalitarian environment, discussion/group participation rules were

created by group consensus. To further break down the teacher/adult student binary, I requested that the students use my first name rather than calling me Ms. Chahal. The purpose of creating a consensus model of rules/guidelines was to prevent mocking or disparaging remarks and instead create an open and welcoming environment.

5.4 The Possible Methodological Weaknesses

Every method and approach in research has weaknesses. For example, it has been claimed that case studies are not statistically valid, as they are unable to prove that a small group represents a larger one (Stake, 2003; Stark & Torrance, 2005). However that is not the intention of C.G.T., as this methodology suggests that the theory that emerges is a result of the interactions of that particular study. Also, there are issues of boundaries/bounding and epistemology (Stake, 2003; Stark & Torrance, 2005). For example, how does one decide what to include and what not to include and, therefore, how does one decide what constitutes knowledge? During the course of this research I found this to be a very difficult question and did, from time-to-time, struggle with the complexity of the data. However, by using C.G.T. as my guide, I recognised that the knowledge created was situational and generated by the participants themselves. This enabled me to always go back to "what they were saying." I know, in addition, that a longer study would have been extremely beneficial, but due to issues within school boards that was not possible. In September 2012, I had applied to a school board. However, I did not hear back regarding my application. In December 2012, I decided to transfer my application to the school board in which Hamlet belongs. While this board was very quick (approving my research in two weeks) and the principal was on board immediately, it took the teacher two and half months, until March 2013, to meet with me. For that reason, I was unable to begin my research until April 2013.

Throughout the course of the research, I tried very hard to make sure the study did not take an anthropological stance; I did not observe from afar but worked with and alongside the students.

Chapter 6: The Discoveries

Pondering Thoughts

The very nature of science is discoveries, and the best of those discoveries are the ones you don't expect - Neil deGrasse Tyson

What is key in understanding is that the C.G.T process is fully emergent. Thus, as I worked through the data collection process, my research methods and resulting analysis did not strictly follow the grounded theory guidelines as set out by Strauss and Corbin. Instead the "I" — the researcher — became the participants' co-producer (Mills, Bonner & Francis, 2006) and there was an embedding of the "narrative of the participants in the final research outcome" (Mills et. al., p. 31, 2006). Charmaz (2008) advocates a more literary than scientific writing style. Consequently, I used that approach when writing my data for the following sections.

My focus group consisted of six students in Grade Eight: Brady, Iham, Riley, Tara, Jaylyn and Yasmina (pseudonyms). These students were bright, thoughtful, energetic and spirited, which is why I refer to them as the Super-Six. Yet even though they were agreeable and interested in the research, they referred to themselves as "dumb," and throughout my time with them, I found that they were disillusioned regarding their school experiences. Students from urban backgrounds are as diverse as the urban environment, and the Super-Six represented this multiplicity. For instance, Brady was one of seven children, and was responsible for the youngest (a sister in Grade One in the same school). He had come to Hamlet in the beginning of Grade Eight after being expelled from his former school for arson. In science class he hardly spoke, finding it boring. But during our time together I quickly learned that he had a love of science and often went home and researched science projects. Iham, the declared "brains" of the group,

wanted to grow up and become a doctor. He asked me the most questions about my background and my parents' immigration status. He was impressed by my educational aspirations and travel experience. In May, Iham missed two meetings due to the anniversary of his brother's suicide. Riley was the jock of the group, a football player who did not enjoy school. He was quiet, thoughtful and always present, but usually observing rather than participating. I later discovered that he had many friends in the drug trade. Tara was a hockey player who had never been in one school for more than three years. She was the transient of the group. Jaylyn was also a mover; she had lived in the United States and Canada, but had a slightly more stable background than Tara. Jaylyn's best friend, Yasmina, was the chatterer of the group. She was of First Nation, Metis and Inuit background (her specific background was not identified) and had one older brother. It was Yasmina who explained to me that I was working with her and her fellow students because they were the dumb class. These six students shared so much with me over the 3 months I worked with them. My aim was to achieve a feeling of trust, and I succeeded. All the information I gathered came from the students directly and not through parents or teachers. Over the course of 3 months, the students shared with me their experiences in school and at home. They told me about their hardships, successes and hopes. In this dissertation, my goal is to honour their voices within the context of my work and to create a theory that can be informed by our meetings to enrich urban education for children beyond my Super-Six.

From April to June 2013, I met the Super-Six seven times (see Appendix H: Meeting Dates). When our meetings began, the Super-Six were the only students in their science class working on the assigned unit. In May, the rest of the class also began working on the unit. All meetings (with the exception of the sixth meeting) were held at Hamlet but never in a formal classroom; meeting spaces were held in a science lab, hallway, computer lab and multi-purpose

room. There was a lack of routine with regards to 'where' learning occurred thus the students were continuously moving. Through my coding process I discovered that the movement of the students negated the relevance of place as central to the learning, rather the spaces of learning became central. In other words, as the place(s) of learning was never consistent this forced the students to interact with each other within the space in different forms, who they sat next to changed, where they worked shifted, the resources they had continuously differed thus the importance of space within places became of the upmost importance. The meetings took place during different times of the day and week depending on other school events. Meetings ranged in time from 30 minutes to 2 hours.

The task I gave the students was based on the Alberta Grade Eight Program of Studies for the Saltwater and Freshwater Ecosystems Unit (Alberta Education, 2003; see Abstract F: created questions for students). Initially I provided each student with questions that were restructured curricular objectives from the Grade Eight Program of Studies (Alberta Education, 2003), with the goal of each student selecting one or two questions and researching the answer, then translating the answers into a lab, demo or game that they would complete and then teach their peers. Working with students requires flexibility, and honouring students' individual pathways to learning means providing them the opportunity to produce their own meanings and conduits of expression. I aimed to create an open and accommodating environment that allowed the students to change questions or go in new directions as they saw fit.

In creating this environment of openness and trust, I disclosed my purpose in the first meeting. During this time I introduced myself and began a conversation (that continued throughout all meetings) regarding the students' enjoyment and/or non-enjoyment of their educational experience. The forefront of the subsequent meetings was project creation, but the

baseline of the project work allowed for conversations to evolve around school, relationships, science and so on. Without the project, however, the conversations would not have emerged. It was during the first meeting that students began to choose questions to answer. In the second meeting the students conducted a survey and finalised the questions they wanted to work on. It was at this point that they began to realise that my purpose was as facilitator and not to provide answers. Jaylyn, Yasmina and Tara found this frustrating. The third meeting was research-based, and I tasked the students with beginning to find answers to their questions. For most of the students, this was the point at which their questions changed from what I provided to what they found most interesting. Questions that stemmed from their personal interests and lives (see Appendix L: Student Created Questions). The students used my questions as a starting point. Then, based on the research they unearthed, they discovered they had other interests.

For example, Yasmine had extreme difficulty in created an initial question. Eventually she came up with:

> Is it important to know who much water is used in your home? How can you find out how much water you use in your home? Can you create a plan to do it?

What this illustrated to me was that Yasmine's initial questions were not of interest to her because she could not relate to them. While her home is relevant to her lived experience, it was not a source of scientific curiosity, this was illustrated by her inability to create a question (see Appendix L: Student Created Questions). After various conversations with Jaylyn regarding taste testing, she transformed her questions to:

> Does juice taste different with tap water, filtered water, and bottled water? Does different types of water affect how juice tastes?

These questions illustrate creativity and personal connection (as she drank juice every day). She not only became focused but her scientific curiosity was fuelled enabling her to create further questions:

> How does it taste? Is it gritty? Does it taste fresh? Which looks the best? What taste the best?

The third, fourth and fifth meetings were project-based; the students finalised their labs and tasks. However, throughout these meetings, discussions occurred that went beyond the projects. During the fourth meeting, Jaylyn had established that she wanted to analyse water from different sources. Riley, finding her project interesting, asked if he could partner with her instead of doing his own project. As the project was hers, she had the final say and she agreed. Brady and Iham, meanwhile, were both working at home on their projects. Brady aimed to clean rainwater by creating a separating mechanism using pressure; his project turned out to be a high school chemistry experiment. Iham took another approach and decided to investigate global water footprints and convert his research into a Monopoly-style board game. Yasmina, inspired by Jaylyn, decided to investigate the impact of different water sources on concentrated orange juice. During the month of April I arranged for the Super-Six to visit and conduct their experiments/projects at the university in a secondary education science lab. The reasons for this were multiple: I realised that they would not have enough time in their mandated class periods to finish their projects; I did not want the formation of their projects to be limited by what they lacked, with regards to scientific equipment in their school; and I wanted them to see the university. Even though the university is a 15-minute car ride from Hamlet, none of the students had ever visited. I wanted to place the seed that attending a post-secondary institution was a possibility for them. For that reason, the sixth meeting was at the university and was entirely based on the students creating and completing their labs. Iham was unable to attend due to the

anniversary of his brother's passing. Our seventh and last meeting was held at Hamlet and was a summary of the past three months. I had hoped that the students would go back to their classroom as experts able to guide other students in the unit, but time constraints made this impossible. However, quite early on the Grade Eight science teacher had contacted me privately to ask about my approach, as the Super-Six were discussing our time together and the work outside of class. She had noticed how excited they were and hoped to engage in a similar process with the rest of the class.

During our time together each student was provided with a journal. The journals served several purposes. They were the main way I was able to communicate directly (and privately) with the students, they provided a place for the students to complete their work, and allowed me to track their thoughts and work beyond our discussions. Thus the journals became a catch-all. The students were required to write their guiding project questions (in their many manifestations) in the journal, as well as to list all required/requested equipment. The journals also morphed into scientific journals where the students wrote their findings and research (see Appendix K: Examples of Student Journals). As we were able to meet almost weekly, there was a thread between the meetings. Within C.G.T., this is referred to as categories and themes. However, for me they were "pondering thoughts." Pondering thoughts were points of discussion that came up and served as starting points for the next conversations or were of such importance that they qualified as topics on their own. In true active interviewing fashion, students had the opportunity throughout to question/interview each other. These sessions provided valuable insight that I would not have been able to obtain as an outsider.

6.1 Pondering Thoughts

A code is a summative, it is an essence capturing an attribute for a portion of the data, and the descriptive codes (which I used) summarize the primary topic (Saldaña, 2003). The coding process occurs in cycles (first cycle and second cycle), but mine was inductive in nature using an axial coding system. Axial coding is relating the codes, categories and concepts inductively. This took a while as I needed to confirm my categories and themes accurately as to best represent the students. In order to do this I had to "bracket out" my own biases in interpreting and selecting data for inclusion. This required multiple attempts at first cycle coding, as I struggled with how to best capture the essence of the students' words because I was hyper-aware of not speaking for the youth.

The first cycle of coding took numerous attempts as it was an open coding process. During my first attempt I pulled out general ideas/codes representing them by phrases and key quotes. But by the time I got to meeting five I realised this was not enough as the ideas/codes did not accurately represent the entirety of what was happening. Next, I tried to use key ideas from literature as themes and linked what I deemed as appropriate quotations. However, I found that this was too laded with my own biases and did not represent the students. In my third attempt I created a table with categories based on patterns I observed (science is boring, hands-on, importance of teacher) but I found this created a very large and unmanageable list. More importantly, these 'patterns' were not actually patterns as they did appear consistently throughout the meetings. So at this point I felt very stuck, I took my transcripts and changed location. In my fourth attempt at first cycle coding, I decided to code line by line. I also decided to only code students, the reason for this is that in order to understand and represent the students I decided that it was the students' words that were of the upmost importance to my research. I

left my literature and biases at the figurative door. I went through each meeting, coding full sentences by one or two summarizing words that were key ideas that jumped out at me. I recorded these key summarizing terms in my workbook, then moved onto the next meeting. I would go back and forth as a new codes emerged. Initially codes were organized via meetings, e.g. in meeting two 17 codes emerged, in meeting four 14 codes emerged. In total 40 qualitative codes emerged (see Appendix J: Codes), at this point I was satisfied with my coding process and moved onto the second cycle of coding (Saldaña, 2003). Entering the second cycle, I searched for patterns in the 40 emerged codes; patterns can be a result of similarities, difference, frequency correspondence or causation (Saldaña, 2003). This is the point where axial coding occurred as I re-read the text to discover the categories that best represented the emerged codes. Axial coding is also the point in which I began investigating how my codes (and eventual categories/themes) related. Thus, when clustering the 40 codes by searching for patterns I was able to create categories (see Appendix J: Codes). A category is a word/phrase that describes a portion of my data. The categories were Acumen, Personal Pedagogy, Fascination, Self, Trepidation, Disillusionment and Elucidate. Next I searched for a means to connect the categories, via themes. This step within the second cycle took a while as I had difficulty initially pulling the themes out. Eventually, using a conditional matrix approach in which I looked at the conditions/actions/interactions and consequences of the phenomena I was stimulated to consider the micro and macro conditions that impacted the Super-Six and how these two levels impacted each other. The emerging themes were based on the conditional matrix (figure 1).

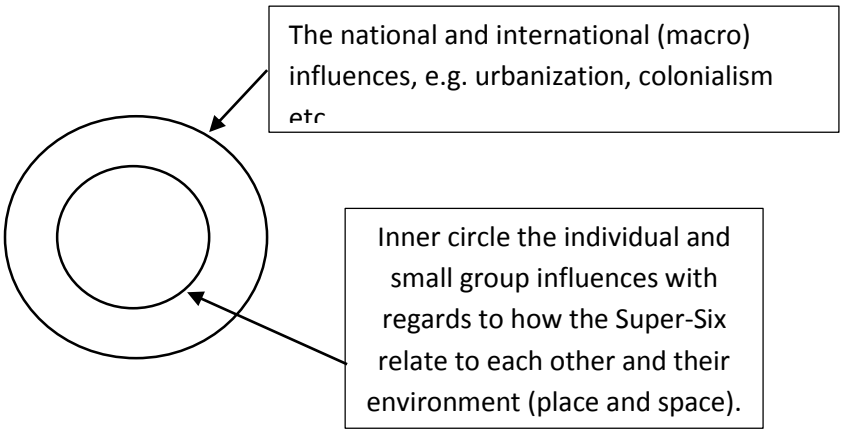

Figure 1

The themes that emerged were: Unheard/Unseen, teacher versus self, choice/independence, co-intentional education, relationship, routine of splace, empowerment and at-promise. I then sought out how to understand how the themes related and created my 5 key questions. By understanding how the themes (and thus categories and codes) related to the 5 questions I was able to pull out how space and place became central to student learning (figure 2).

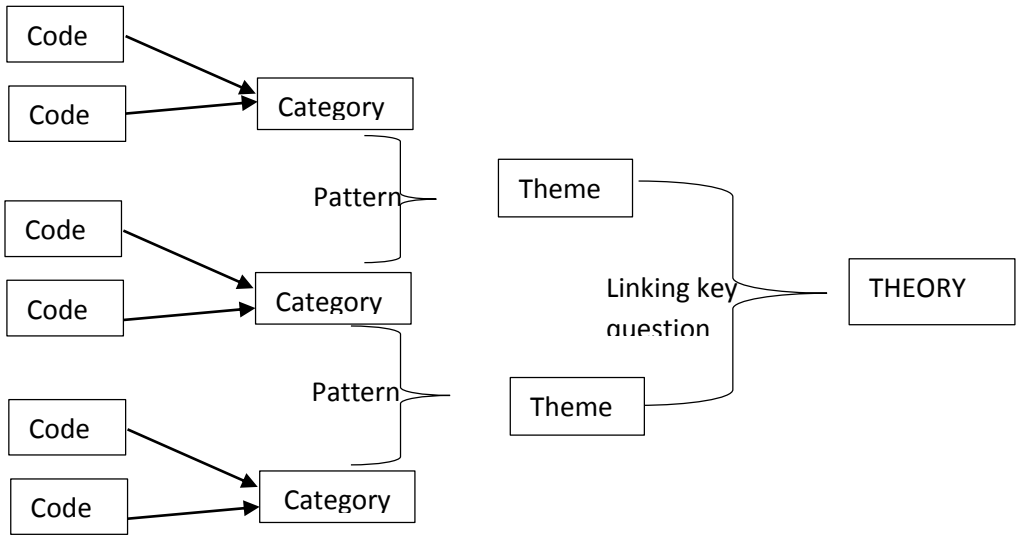

Figure 2

I realised that in answering and connecting the 5 questions that s/place allowed the students to disregard the chaos of changing places and build relationships they deemed as necessary. Providing the opportunity for the Super-Six to pursue self-directed learning with tactical guidance that not only empowered them but also promoted co-intentional learning. They worked together to form and re-create knowledge. By building these relationships the borders of the liminal spaces that surrounded their hybrid selves within the place of school and urban were reduced and thus transformation was possible. As discussed by Gruenewald (2009) 'domination is maintained not through material force but through material forms' (p. 628) such as the classroom, lack of resources etc. The students reduced domination through form via s/place. The Super-Six created communities of affiliation and communities of affiliation was how critical pedagogy strengthened their connection to others and their regions (Gruenwald, 2003).

Throughout the process I came to realise that what was of most significance was not the project but the process. As process was central I focused only on the students words and actions, not their artefacts. For that reason, the sixth meeting (the one that took place at the university) was not included from the overall coding process as no discussion regarding process occurred. The themes are: pedagogical philosophies, unheard/unseen, teacher versus self, choice/independence, co-intentional education, relationship, routine of s/place, empowerment and at-promise. I shall be discussing each in detail. What follows is an exploration of these key themes in relation to questions that emerged throughout the research and coding process; the questions are posed from the student perspective. Additionally, as noted earlier (Charmaz,

2008b), these questions focus on the what and how:

1. How do I learn?
2. How do I complete tasks?
3. How do I give and gain knowledge?
4. What is important to me?

My overall research question was - How can pedagogy of place enable students to use their liminal space within the urban environment to critically engage with their science education? My goal was to obtain the answer to my research question by analysing the students conversations within the context of the above four questions. All of the conversations with Super-Six were insightful and revealing. What I have found the most difficult is honouring their voices while not placing every word into my work. I continue to struggle with this. The student comments and excerpts that follow are a culmination of all seven meetings.

6.1-1 Pedagogical Philosophies

During our meetings, the students would easily discuss their favourite subjects and teachers. In doing so, what emerged was their own personal pedagogical philosophies. The students (Jaylyn in particular) were able to eloquently explain not only what they preferred but the type of instruction and learning they did not desire. During the first meeting, only one student (Iham), admitted to enjoying science, and all agreed that science was not their favourite subject. It was during this meeting that it became apparent that there were many different factors at play when the students described their learning. These factors included teacher influence, independence, disillusionment and personal preference.

Each student described his or her preferred learning process as self-directed; they preferred hands-on tasks that, at times, might require intervention by the teacher. However, they did not want hand-holding: they preferred what I call tactical guidance. This is what I defined as their personal pedagogy. They wanted to give and gain knowledge by sharing and discussing their thoughts, while being given support and approval by their teacher.

Y:	Well, it just depends. People have their own like goals for themselves. If they like want to goof off in classes, like it's their fault. Like I goof off all the time and then it's like no wonder I get bad grades on my tests I've taken and stuff 'cause it's my fault. And a lot of people are like that too, like that they don't really care.
J:	But then they blame the teacher.
Me:	That's awesome that you take like responsibility ... So then what could the teacher or the adults do to make you interested?
Y:	I don't know.
I:	You can't just expect to do like experiments and play games all the time ... If you're not making the effort for the teacher, the teacher's not gonna go out of their way
Me:	So you think it's a very reciprocal relationship?
I:	Yeah, relationship. The students have to put an effort in order for the teacher to do fun things and make it interesting.

The students were trying to talk to their teacher, but from their perspectives the teacher did not seem to be paying them any attention. While it was evident to me that the students desired independence and approval, the lack of perceived teacher support led to the students feeling voiceless and invisible.

6.1-2 Unheard/Unseen

Me: So what is it that you don't like about certain teachers?

Y: When teachers can't explain things properly.

Me: So explaining things is important?

T: When they get mad really easily when you ask a question

I: Or like when you generally don't understand something.

Me: When you honestly don't understand it?

I: Yeah, but that they over exaggerate. It's like, I told you this a million times. No, but it's like some people are slower.

Me: Does everyone agree with that?

All in unison: Yeah. Or how they go about it. Like how they say it.

Y: Like if you don't explain it -- like if you don't understand that one way they do it, then they could explain it a different way.

This excerpt from the first meeting illustrates how the Super-Six had a very clear impression of not being heard, validating my earlier statement underlining how often students within urban centres are voiceless. The excerpt also describes how the teacher(s) didn't take the time to explain things or made the students feel like they were at fault for not understanding the lesson. From this point in the conversation we began a discussion regarding science, specifically and what they enjoyed the most. The answer to this question was science experiments.

Y: I like being able to pick my experiments. Like if you can pick your own topic of the experiments

Me: Do you guys get to do that?

J: Well, in L.A. we do.

Me: But not in science?

Y: Not really. She gives us an experiment and we choose groups and we do it.

Y: Science is just not really interesting, it's not very intriguing.

I: A large part of it is on the teacher, too. You can't just hate science because you had one bad teacher.

Y: I love social. Social's my favourite because [of] Mr. G.

I: Yeah, because Mr. G. is an amazing teacher.

T: I don't think it's science we hate, I hate it because mostly I don't like -- because we make it boring.

This point in the first meeting is when the Super-Six began unpacking their learning while at the same time beginning to take ownership of their education.

6.1-3 Teacher versus Self

The Super-Six felt that the teacher had a huge influence in their learning but then began to acknowledge that perhaps the reason for their lack of independence in science class was their own behaviour. The students' belief of lacking independence due to one's own behaviour, I coined as apprehension. This concept of apprehension was expressed in all meetings. I felt that this apprehension stemmed directly from a disillusionment the students had with themselves as well as their teachers and their school.

J: Are you just doing our class?

Me: Yeah.

Y: Why? Are we like the dumb class or something?

Me: No, I really wanted to work with Grade Eight students.

Y: I think we're a bad class because our average is like 50 something or 60 something. So it's really bad.

The apprehension that the students felt did not distract from their desire to become "professionals" in the world. As my aim was to focus on the students that were in front of me,

eventually I discovered what it was the students hoped for their futures. Yasmina discussed wanting to be a marine biologist or a lawyer. Tara wanted to join the military, and Iham wanted to become a doctor. Jaylyn, Riley and Brady never discussed their hopes; rather, they seemed to just want to finish the school year, planning to work harder in future school years. But their perceived ability to realise their dreams was tainted by their impressions of their teachers'. The Super-Six felt that they were doomed because the people who were charged with paving their pathway to their future aspirations had no interest in helping them to achieve their goals. From the students' perspective, their teachers did not feel the students were worth the effort. And at that age, perception can be overpowering. The lack of encouragement the students felt led to a feeling of hopelessness (Giroux, 2001; Taubman, 200). The hopes the Super-Six wished for, was "packaged as the promise of neoliberal capitalism" (Giroux, 2001, p. 111), that of the professional aiding the economy. But because they felt they were dumb, and bad, the neo-liberal hope of prosperity was not attainable. There was nothing to hope for (at least in the beginning of our work together). The first meeting set the tone for the rest of our discussions. The following meetings revolved around the disillusionment that the students felt, the impact of the teacher and their own personal learning preferences. So what is it that the students sought?

6.1-4 Choice/Independence

Y:	You have to do something interesting to capture our attention. And if it's not interesting, then you talk.
Me:	What is interesting?
T:	Hands-on stuff.
Me:	Hands-on? Does it always have to be hands-on?
T/Y:	Yeah.

[I then asked them what their favourite subject is]

J: Social studies is really fun.

Me: … it's not technically hands-on, is it?

T: No, it's because of the teachers making it fun.

Y: But we do have projects. It's so awesome.

I: It's 'cause he doesn't really teach us.

J: You teach yourself.

Me: How does he teach you?

[The students then discussed how their social studies teacher provided them with a booklet they had to go over as a class and they were then given a project to complete. The projects were in various forms such as posters and videos, but what seemed to be the most important was that the students were given a choice of what to create.

T: And you can make your own.

I: He gives you an assignment and he's like, you can go at it anyway, like some people make videos.

T: He gives you options.

Y: Or posters; some do booklets.

T: Because we're, like, you're making your own.

J: He's not holding your hand through the whole thing.

T: You get to make your own and then you don't, like, understand it and you just ask and he gives you the answers. And then he explains to it with you (sic).

Through this dialogue it was apparent that the students desired choice. They felt they were able to question this particular teacher and receive clarification. The maturity demonstrated by the Super-Six was not born out of confidence. Because of their own self-doubt and anxiety,

the students felt insecure about their ability to make decisions. For instance, Jaylyn and Yasmina would double-check spelling with me, or would ask exactly what was expected of them. Brady and Riley were often silent. However, during the meetings leading up to the project day, (the sixth meeting), Brady and Riley were focused and diligent when researching their respective projects. After the project day, Brady, Riley and Iham were focused on discussing our time together and expressed that they were upset that the girls were not taking our conversation seriously. As well, on project day, Brady, Jaylyn and Yasmina became focused leaders and all of the students demonstrated quick decision-making skills. They took clear ownership of their learning. Additionally, the students had to be able to explain their projects to each other (co-intentional education), while researching and conducting their projects. Signifying their fascination with their projects as a result of the choice and freedom they had been given.

6.1-5 Co-intentional Education

The students also discussed the difference between the importance of teacher-directed learning versus taking ownership of their own learning, In actuality, what was being discussed was co-intentional education.

Y: This is, like, all we're saying [is] how we don't like a lot of teachers and that it's, like, when we go to, like, high school or something there's gonna be teachers that we don't like and we can't just, like, not do our work because we don't like the teachers.

T: The same kids that don't want to learn, the majority of our class, can just, like, [say], I don't care what my marks are, just Grade Eight, like Grade Nine, become a Grade Nine and they'll be, like, I don't care, it's not Grade Ten.

Me: All you guys are [taking] provincials [exams] next year, right?

T: I'm not gonna change.

J: I'm trying next year.

Me: Why next year?

J: I am already so far into this year but not caring.

I: No, but you can't like... It's, like, building.

J: There's too much stuff *Iham*

I: If I make stairs, no, you feel like it's, like, you can't go to the next stair if the first stair isn't sturdy

T: You can.

I: No, because you won't know enough to move on.

Iham's comment is a profound analogy. He clearly understood the building block nature of the Program of Studies and tried to impress on his peers the importance of not deferring their attempts to learn but rather focusing on the now. Iham began to discuss with his peers why the need to study now was imperative and not to defer learning to a future that may or may not happen. What these passages illustrate was the desire of the students to learn. While they notably understood the importance of the teacher, they also equally appreciated their own learning needs, refuting the fallacy that inner-city youth neither care nor want to learn. The project provided the backdrop for co-intentional learning and discussion to transpire, because the education that the students were partaking in served a purpose and was directly connected to their personal interests and lives. The students wanted a balance, a teacher that provided them with the space for autonomy while being present enough to answer the questions they may have had – they wanted to be both seen and heard while being treated with respect as individuals. This was clearly demonstrated during project day. Prior to project day, some students had been double-checking everything with me. By project day, they were able to clearly explain their projects and purpose to me and to visitors to the class.

Me: Why don't you focus in class? Yet when it came to coming to the *university*, you were in charge of your project. So why can't you do that in your classroom?

J: I don't know.

Me: That's not a good enough answer.

J: Depends on who I'm working with.

J: I really don't even know. I think it's because it's hands on and it's fun and I was with *Riley*

What was interesting is that during the project day what had occurred in actuality was the opportunity for cogenerative dialogue (Roth & Tobin, 2005), enabling the Super-Six to

> reflect together on a lesson ... the participants have a concrete, common object on which to focus verbal interactions. The purpose of the session is to articulate salient elements of what worked and what did not work for the purposes of designing strategies for improvement (p. 315).

The students unquestionably enjoyed our time together and felt that learning had occurred, but at no point did I actually instruct them. The independence that they desired was given to them freely and as a result they created open and safe relationships in which they assisted and taught each other. I was the instigator, not the teacher.

6.1-6 Relationship

Relationships are only possible in the presence of trust, something these students (like many urban students) did not give freely. Their desire and need for dependable and consistent relationships was best demonstrated when they discussed their former school principal.

J: The new principal … He's not making it better for the students; he's making it better for the teachers in every kind of way.

J: [The former principal] knew all the students.

Me: How long had he been here for?

I: Oh, he was here for, like, in the beginning

T: And he'd say hi to everyone in the hallway. He knew everyone's name.

Y: He knew what the kids like[d], he knew everything and he knew, like, he knew how to get, like, stuff across. He knew, like, he was serious. He was really chill.

I: Like [in a] friendly way.

Y: Yeah, and he was, like, someone you could like go talk to all the time and he knew a lot of, like, names. He knew all about, like, everybody.

Y: And he knew all the stuff about us, like, he knew my mom, like, talks, so he knew all the stuff about, like, me and everything and so he knew, like, what kids were going through.

I: He was like the foundation of [Hamlet] because like he knew all about [Hamlet]. He was, like, it's really ghetto, there was a lot of bad kids.

Me: What does ghetto mean?

I: Like there was bad kids and there's, like, there was, like, [kids who] would sell drugs in the hall. Like, they'd sell drugs in the hall and teachers would... they'd swear at teachers and the teachers wouldn't do anything.

J: He changed it.

I: He's the principal that changed it.

J: And then he had to leave last year.

Y: And then now kids this year.

J: Going back to their ways.

Y: Are going back to the ways, going back to the way it is and Mr. L. just doesn't do anything. He's all about, like, the technology and all about the...

J: Teachers.

When discussing their current school environment, students stated how much they disliked their school community. They said that they detested their dictated and pre-determined pedagogical place of study. The reasons for their strong negative feelings were a lack of space, freedom and, most importantly (to them), their new principal. They stated that their new principal was there for the teachers and not them, that he did not even know their names. His behaviour contrasted sharply with that of their former principal, who knew their names, spoke Farsi, knew their parents and "their lives" and, most importantly, saved them from being ghetto. When probed, the students made it clear that they felt that Hamlet had been a ghetto school. The Super-Six initially laughed at me when I asked them to define ghetto. I wanted to be clear in understanding their definition of their urban environment. As discussed earlier, urban environments have their own culture, language and sense of being. The students defined their ghetto as a place where teachers were afraid of the students, drugs were rampant and education was not important. They explained how their former principal "rescued" them and their school, how "he pulled them out of the ghetto". While I could discuss the saviour/messiah undertones of the students' feelings toward their past principal, what I believe was most important was the lack of relationship the students felt they had with their current principal and, thus, the teachers. Ultimately what they felt was a lack of power within their school environment. Under the new school leadership, the students felt that they lacked the power to influence the daily events of their educational situations; they lacked agency, and this resulted in non-conforming and/or disobedient behaviour. This lack of connection led them to identify as a bad/dumb class, which led to a discussion of how they felt that the teachers wished to split them up in Grade Nine. When queried as to what they thought about this possible change, Brady stated that if he was not with his current Grade Eight class into Grade Nine he would no longer come to school. What is

interesting is that Brady was the one student who did not seem to talk with any of the other students, yet it was clear that his feelings of connection with his peers kept him in school. The students stated that they detested their dictated and pre-determined pedagogical place of study. The discussion of the importance of staying together highlighted that the students cherished the relationships they had with their classmates. They also understood that it was, in fact, these precious relationships that could (at times) hinder their learning. Their opinions about their current/former principals highlighted that they now felt they lacked meaningful relationships with the adults in their school

6.1-7 Routine of S/place

In my attempt to create a routine with the students, what emerged in actuality was not a routine of place or rules, but a routine of people within the place: a routine of s/place. The ability to have a third space of learning (be it the lab, university, etc.) meant that the students did not depend on place as their pedagogical guide. This interruption to routine was a positive.

When questioned as to why this disruption was important to her learning, Jaylyn seemed to be more focused

J: Because I like how it's only like a small group of us. In the class it's really like – there's a lot of people.

Me: How many people are in class?

J: Twenty seven? Twenty four?

I then inquired about how class size impacted their learning

B: [W]e just sit there. Read.

R: The other class do experiments. It's because usually our class goofs around and we don't get to the point where we get to experiment. The teacher is like, you know, they haven't been behaving so why we should we do something.

Probing further, I questioned them about their enjoyment of science class based on class size. Because, when I first met the students, all but one (Iham) mentioned disliking science.

Me: *Brady*, you're actually quite good at science, but you don't care what your mark is? Why?

B: No clue.

Me: Is there subject that you like?

B: Science. That's it.

This was new. During our first meeting Brady had stated that he enjoyed "nothing" at school. The students' desire for smaller learning groups directly correlated with their enjoyment of science. They felt that they had more opportunities for learning, and vocalised that they felt this was the major difference during our time together. This was why they considered our work as "fun". At this point in the conversation Brady, Iham and Riley became overtly frustrated with the girl's lack of concentration.

H: I'm disappointed in you. You're not applying yourself.

R: You guys can do better. Come on.

What was interesting was that throughout our work together, Tara, Jaylyn and Yasmine were consistently chatty. Yet, after months of working together it was during this last meeting, that the boys vocalized their opinions about the girl's work ethic. After this exchange the girls began to

focus. Illustrating not only the impact Brady, Iham and Riley had as peers, but also how the boys felt more comfortable disclosing their desire to focus and learn.

Y: She [Jaylyn] doesn't really work good with any friends because like everyone lives so far away from us.

Yasmine's comment reinforces the importance of location to learning in the school environment. Tara who now considered herself a part of the group, discussed how when she first came to the school she did not want to be a part of this particular class. A conversation ensued about how their class was the bad class.

Me: Do you consider yourselves a bad class?

B: Yes.

J: Yes.

Y: Yeah.

R: I don't.

Me: You don't. *Riley*, why not?

R: Because every class is – like odd –

I: Considering we're 10% - like our average is 10% lower.

R: It isn't that bad.

I: That's terrible.

Y: That's horrible.

B: That's horrible, dude.

R: No it's not.

What is noteworthy is that during the first meeting the students self-identified as the bad/dumb class. During the last meeting, the students discussed how they felt they were perceived as the bad class. Yet Riley, who hardly spoke during the previous months, was adamant that they were not that bad. This is a tremendous shift, from blaming themselves to recognising that labels were placed on them, and Riley was no longer satisfied with the label. Riley no longer believed that the marker of a grade justified the label of bad, illustrating that there is more to his perception of a good class than grades.

[After discussing their label as a bad class, the students discussed how the teachers wanted to split them up]

Me: Do you want them to split you up?

B: Make me not want to come here.

Me: If you were split up?

B: Yeah.

Me: So your friends mean something to you?

B: Well, yeah.

As their lives were changeable and shifting, their learning of place should as well: "a pedagogy of place coexists with the particularities of where people actually live" (Gruenewald, 2003). If their particularities are unstable and inconsistent, what becomes important is not the place itself but the spaces for relationship building, power building, and hope to emerge – what is relevant is the s/place. As exemplified by the above passages, through this lack of routine the students now had a new enjoyment of their science class. The Super-Six demonstrated the direct influence they had on each other with regards to focus and learning and established a new level of comfort with sharing of opinions. They discussed the importance of location to learning, were

empowered to reject labels placed upon them and in particular confirmed the important role that they had in each other's learning processes. Furthermore, when answering the questionnaire (see Appendix M: Final Questionnaire) at the beginning of our last session the students all changed their beliefs regarding the important of science to their lives. With the initial survey the students all disagreed with the statement "I can use what I learn in science in my life outside of school." But when answering the question "Is science important outside of school?" all of the students changed their answers. Riley, Brady and Jaylyn, Tara all answered that it was very important and Iham and Yasmine went further:

> Iham "definitely, I think more about things and differently and question things," Yasmine "it is more important outside of school".

6.1-8 Empowerment

What was essential in the learning processes of the Super-Six was the importance of the opportunity for choice and control. The opportunity to control their learning, their learning space and their sense of being important within the school environment, led to a feeling I termed as empowerment.

> Y: … If you want to learn, do it, and if you don't want to learn. you won't.
>
> T: [discussing the focus of students in her class] Tells the maturity level of different other people, so, like, if you're mature enough to understand the fact that you actually have to learn or if you're not that mature, then you just goof off and talk about it, and Mr. G. sees that. And usually he talks to the kid and, like, hey [says], to get your work done [or] you're gonna have to stay after school.

The students understood that learning required maturity and that their education was in relationship not only to their teachers, but to their peers and themselves. To verify this notion of empowerment in the final questionnaire I asked "[w]hat do you think about our time together? What have you liked or not liked?" Iham's response summarizes empowerment better than I can, "It's been a good time, and we've changed our way of thinking. Monica encouraged us to question everything."

6.1-9 At-promise

During the last meeting, the students received their grades for the unit and the year. The pride in their voices and the joy in sharing their grades was infectious. They were no longer the dumb class.

J: Guys, I didn't study at all and I got a B.

Me: Now, how does that make you feel?

T: How does that make you feel?

J: Angel can't and she said she's smart.

Me: She is?

Y: I thought I had C's this year. But it turns out I'm on honours.

[The students then learn that if they got a star on their paper it means they are close to the next grade.]

R: I gave my mom the test and she got, like, nine wrong.

B: I got a star.

Me: Sweet. So B too? … I'm so proud.

B: [Brady discussing how his exam has a star] Mine does. Bad.

R: I'm pretty proud of mine.

The labels that many of the Super-Six placed on themselves (dumb, stupid, etc.) and felt had been placed on them (bad, misbehaving) Otherized them in comparison to their 'good' peers. However, with their exam results they no longer felt on the fringe due to ability. The Super-Six were no longer cautious about their hopes, and their aspirations. Their future(s) were no longer unimaginable. Even though they felt that they had no power and lacked support from the majority of the adults in their school, they felt that they had the support of their peers and wanted to share their grades with each other. Whereas in April they were unrelenting in their self-identification as the bad/dumb class, they were now considering that they were not, that they had promise. This led to a conversation regarding our overall time together.

Me: We've spent almost ten hours together for a couple of months. Why?

Y: That's wild.

Me: Why? What was the purpose of you guys creating your own activities?

R: To make science fun.

Me: Okay.

Y: To help us understand it better.

Me: Did it work?

Y: Yeah.

J: Yeah. I got a 76 on my test when I normally get like 50's so I'm pretty sure it worked.

As stated earlier, the purpose of my research was not an improvement of performance "but rather a situational and contextual understanding of learning." What I discovered was that this moment of performance improvement for the students demonstrated a change in how they

perceived themselves. Specifically, how they felt about their learning. Calabrese (2003) made a point that urban classes spend "more time reading from textbooks and completing worksheets" (Calabrese, 2003, p. 25) while having "reduced access to new textbooks, scientific equipment, and science-related extracurricular activities" (Calabrese, 2003, p. 24). My experience with the Super-Six was an example of this phenomenon. The Super-Six felt that the majority of their learning in science was spent reading from textbooks and worksheets (this was not confirmed with their teacher), following prescribed experimental guidelines (usually in groups, due to a lack of scientific equipment). With our project, the students were able to pick any method of experimentation they desired, and this was noted as particular importance to the students. In the final questionnaire I asked, "[h]ow is it the same and/or different to what you do in class?" Riley's reply "totally different, because we get to choose what we want." While it did have to be scientifically valid, with some rules (for example drawing in pencil, multiple testing, etc.), the method that they designed was up to them. The opportunity to select the avenue of discovery that most interested them began to break down the teacher/learner binary as they became teacher, learner and researcher. The breakdown of this binary and the opportunity for both co-intentional learning and independence led to a re-think about the topic of water and, subsequently the subject of science.

Me: Was water more interesting?

R: No.

Y: Yeah. Kind of.

Me: So [Riley] and [Yasmina], did you guys like working on this project over the last few months?

Y: Yeah.

R: That was ten pounds more better than that.[Riley reference improvement in terms of weight, hence ten pounds better is a significant improvement]

Me: Why?

R: Because that is –

R: Obnoxious, because it [is] just doing the same thing over and over again, just different subjects.

Y: I'm pretty sure because it was hands on, he liked it. A lot of people that changes their aspect of things.

In the final questionnaire I asked, "[w]hat did you think of science before we started, how about now?" Yasmine's answer demonstrates clearly the shift in attitude regarding science, "I didn't particularly like science, I didn't think it was interesting, now I like it because it's easier to understand and it's kinda more fun." I found that too really probe into what had changed about the students' views of science, I had to elicit a few consciousness-raising questions. For example:

Me: But here's the question: did you like it more because you got to choose what you wanted to do?

R: Yeah.

Y: Because I like how it's only like a small group of us. In the class it's really like – there's a lot of people.

Me: So did you kind of get more interested in water?

T: Yeah, kind of.

Me: [Jaylyn]?

J: Yeah.

Me: How about you?

Y: Yeah I got it. My interest.

R: Next time I'm drinking water, I'm going to be thinking about it a lot.

Me: Next time you're thinking about water?

R: Next time I'm drinking water, I'm going to be thinking about what's in it and what [is] not.

Me: Cool.

T: Is that a good thing?

Me: That's a great thing.

Tara exemplifies how the students were still apprehensive. Ideally I would have wanted to extend this project into the new school year and discover if continued work together in this open manner would have led the students to gain even greater confidence in their own abilities.

Chapter 7: Theory Generation

Self Examination, How, What and Why, Relating Themes to Questions

Experience without theory is blind, but theory without experience is mere intellectual play – Immanuel Kant

When I was a science teacher in London, my students were from culturally and linguistically diverse backgrounds. Responding to their diverse experiences and needs became the motivation for my research focus: urban science education. I believe that science is wondrous and it is our responsibility as educators to share this with our students. To motivate them to be curious and to seek solutions to the many questions they may have. Through my own background, I am acutely aware of the injustices and inequity that exist within the educational milieu. Yet if there was no hope for change, my work would be futile. I sincerely believe there is a possibility for change and the answers lie not in policy reform but instead in our students. Working with students' at-promise has become my life's work.

The goal of my research was to investigate how students, when provided with the opportunity, begin to personalise and identify with their education through curricular modification. As an educator who has worked in global urban centres with at-promise youth, I have experienced the necessity for programs that promote inclusivity, inventiveness and equity. As urbanisation expands and cities grow, there is an increasing need to provide just and equitable educational opportunities for all learners. What is essential is that what students are learning via these opportunities is relevant to their lives. Specifically, I explored how students' agency can be fostered by explicit attention to their awareness regarding engagement and understanding. The

emphasis became the process in which the students began to take ownership of their learning through a focused activity. The focus on process led to the creation of a theory of s/place; in which the how is explicitly connected to the why. According to Charmaz (2008b), "a social constructivist approach encourages *innovation* (my focus); researchers can develop new understandings and novel theoretical interpretations of studied life" (p. 398), requiring the researcher to examine one's "own position, practice and research situation" (p. 398), reflexivity and social constructions. Through studying the data, the emergence of a theory is possible. However, it must be noted that "in actuality few grounded theory studies build theory, but many provide an analytic handle on specific experience" (Charmaz, 2008b, p. 401). Thus, the goal of this chapter is to return to the major themes illustrated throughout my dissertation by highlighting the patterns within the categories created via the codes.

7.1 Self-Examination

Before moving forward, I must look back, exploring not only who I am as a researcher but also my personal understanding of the studied situation. My experience living, working and studying in urban centres has at times isolated and labelled me. I frequently felt disconnected from those around me, and as a result I understand the importance of school — as a place of learning, a place to be safe but also as a place for the potential to cause damage. Being a visible minority in the 1980s and 1990s, I stood out. My earliest memories of racialisation involved my teachers and the school environment. Teachers were the first to project their stereotype of Other onto me and objectify me based on my colour. Combined with the lack of representation in the curricula, this feeling of Otherness was actualised at school. When I crossed the physical barrier of the Atlantic Ocean, I began to deconstruct my mental barriers, coming to grips with the

students that were in front of me. In England, for the first time, I felt that I belonged. I saw images of people with Indian backgrounds on television, in books and advertisements. What I began to understand was that while I defined myself as Canadian, many of those that I came into contact with never did, always asking me "where are you from, where are your parents from?" It was while in England that I found myself: a hybrid identity of Canadian, Indian, English, urban and suburban. Furthermore, working in London I began to understand that my supportive and concerned nature towards troubled youth was a product of my own background. I saw my brother, my friends and myself reflected in my students. As an educator, I have had many difficult and tumultuous years - the London bombings, death of a sibling, murder of a student, violent assault of a fellow teacher and my own students. I, too, was assaulted in 2007 by a student. Yet I persevered, attempting to make a difference. My background enabled me to see the students in urban environments as more than troubled, lazy or worthless. Urban students cannot be defined by a singular word; they are in themselves multiple. Like me, each has his or her own hybrid identities merging multiple selves into one. It is through my work that I hope to honour these students' multiple hybrid selves.

As teachers and educators, we have power, be it destructive or supportive. As such, we have a duty to our students to understand their complexities. My history with the Alberta public education system began when I was a kindergarten student. My identification then changed after graduating from the Faculty of Education from student to junior high school teacher, then to a graduate student, to an undergraduate educator and now an urban researcher. I have been forced to stand on the line bounding each of these "identities" and to try to balance my feet on both sides of the margins. As is the case with my students, this ability to stand on both sides of the margins creates the opportunity for transformation. I have become acutely aware of myself as an

ethnic/visible minority, female, teacher/educator, student, researcher, daughter, friend, partner, aunt and imposter. While these labels have different implications — some imply a sense of power (teacher, researcher), others suggest powerlessness (minority, female, student), connection (daughter, friend, partner) and purpose (aunt, teacher), they all provide me with insight into the world of the urban. As each of these labels are identified simultaneously onto me, within the urban environment. Rather than being a child who was ashamed, mocked or ridiculed, I am now an adult who possesses her Otherness as an asset. This is a benefit in understanding children who may also feel different and Otherized. This is what I believe was my biggest strength in undertaking this research. My personal renegotiation of identity was essential to my research, as it provided me with the ability to be reflexive and to genuinely understand the context and construction of the urban educational environment.

7.2 HOW, WHAT and WHY

In answering my overall research question - **How can pedagogy of place enable students to use their liminal space within the urban environment to critically engage with their science education?**-four sub-questions (from a student's perspective) emerged that were of importance:

How do I learn?

How do I complete tasks?

How do I give and gain knowledge?

What is important to me?

As I was writing this chapter I realised that a fifth question was relevant: What hinders me? This question is directly connected both to the students' fears and what they feel is important to overcome in order to succeed. In trying to answer the questions, I created categories and sub-categories which, hopefully, honoured the students' voices. The purpose of these categories and sub-categories was to produce meaning while validating the Super-Six's personal learning processes. Generating a theory that is not only informed by the Super-Six but also able to be utilised with students/educators/researchers who find themselves in similar contexts.

The reason that this work is of such importance to me is that students who live, study and work in urban environments are often overlooked. Their brilliance is dulled through a consistent grinding down of who they are. By being told that who they are is not important, that what they know is not valued and ultimately that they are of no importance or significance. The students from my past and the students in this research project doubted their value. The purpose of my work is to highlight their radiance as individuals.

7.3 Relating Themes to Questions

The themes I created were: Personal Pedagogy, Unheard/Unseen, Teacher vs. Self, Choice/Independence, Co-intentional education, Relationships, Power and Empowerment, Routine of S/place and At-Promise. An examination of the students' discussions via these themes provided answers to the five emergent questions and ultimately my main research question.

7.3-1 How do I learn?

Each student learns through his or her own personal pedagogical philosophy. The students' philosophies were heavily affected by teacher influence, independence, disillusionment

and personal preference (categories). At times the students felt that their teachers hindered their learning because they were not worthy of help. Through the project what emerged was the students' desired self-directed, targeted education (their personal pedagogical philosophy). Each of the students preferred hands-on tasks that required tactical guidance from their teachers. This was most apparent during meeting six. While I did not have data regarding the process the students undertook during this meeting I do have insights via my own observational data. What I noted was that the students were taking control of their own learning, this was best exemplified via Jaylyn and Yasmina. During most meetings both Yasmina and Jaylyn were unfocused but this was not the case during meeting six. They directed their male counterparts, stated what was to happen and when, wrote down all observational and statistical data. Yasmina and Jaylyn took full control of their projects, affirming how their desire for self-directed learning meant they felt they were in control. Additionally, each student was required to explain what they were doing to outside participants (science technician, secretary and fellow graduate student). What I observed, was that each student was able to fully explain their procedure, process and purpose validating how interest and self-directed learning lends to active not passive learning. Additionally, what became important in their philosophies was their routine of s/place.

The attempt to create a regularised third space for learning failed. What emerged instead was a routine in which change was the norm. As discussed, urban youth live a life in flux, in almost constant change. A place of learning needs to acknowledge this fluctuation, as the place is merely the backdrop for the potential for relationship building and, thus, learning. The routine of s/place was in fact a routine of flux and flexibility, an understanding that change was not a hindrance. While the locations (places) fluctuated the people found within it were consistent. Thus, the constancy of individuals within the constantly changing places aided in reducing the

boundaries (space) between the students. S/place became of the utmost importance. The figurative reduction of space between the students resulted in many things: it created a desire for Brady to stay in school; a feeling of pride for the students regarding their learning and a grade improvement as demonstrated by Riley, Yasmina and Jaylyn; and a re-think about the importance of water and science in all of their lives. These examples are proof of a change in attitude regarding science. They are breakthroughs, and they occurred not because of the location in which the learning took place, but because an opportunity was presented to nurture the space for relationships within the places.

7.3-2 How do I complete tasks?

For the students in the study, the key to task completion and, ultimately, an enjoyment of learning, was the ability to choose and have independence in educational opportunities. The students were most engaged when they had the chance to create their projects. Which afforded them freedom, via the teacher, to pursue their pedagogical philosophies of self-directed targeted learning with the assistance of tactical guidance.

7.3-3 How do I give and gain knowledge?

By being granted independence and choice, the students began to share/gain knowledge through co-intentional education. Having autonomy meant that the students were able to freely talk to each other. Which led them to take ownership of their learning through a task-based activity, they had the choice for self-directed learning. For example, Iham's explanation regarding the building-block nature of the Program of Studies to the group.

7.3-4 What hinders me?

What the students felt hindered their enjoyment of school and learning was the feelings of being unseen and unheard. The students were disillusioned with regards to their educational experience. They felt cynical, which was exacerbated by feelings of powerlessness. Power, or more importantly, the lack of power, led to feelings of unease, nervousness and misgivings about their personal knowledge. Thus, they acted out: they felt that at times they lacked the power to affect their daily educational circumstances.

7.3-5 What is important to me?

I believe that in trying to understand how important place is to educational opportunities, it is essential to understand what the students find important in their learning environments. The students felt that the relationship(s) with their teacher(s) were of the utmost importance. While this is not new, the concept of teacher versus self meant that the students often felt that their learning and their hopes were in direct conflict with the lack of aspirations their teachers had for them. This made them feel hopeless about their education. While the students felt a lack of encouragement by many of their teachers, they did recognise those teachers that provided them with independence, classifying these teachers as excellent. The concept of the teacher versus self leads directly to the concept of relationships. For the students, relationships are difficult to form due to a lack of trust. But when the students found that they had formed a relationship, whether with teachers, peers or the principal, the students cherished those relationships. Having strong relationships led the students to feelings of empowerment. The foremost sentiment of empowerment was expressed by the students when they had control over what they were

learning and their learning space. Ultimately, connecting the themes of teacher versus self, relationships and empowerment led to an understanding of the students as at-promise. Even though at times the students felt powerless, or lacking in support from the adults in their school environment, they realised that they had each other – s/place. This realisation transformed their engagement not only in terms of gaining knowledge, but also in terms of sharing it.

Finally, to answer the question, "**How can a pedagogy of s/place enable students to use their liminal space within the urban environment to critically engage with their science education?**" The resulting answer and, consequently, theory, is that s/place allows students to disregard the chaos of changing places and build the relationships they see as necessary, allowing them to pursue self-directed learning with tactical guidance (from educators) that not only empowers them but also promotes co-intentional education. This theory is not only emergent from the data (Charmaz, 2008; 2008b), but accounts for the context of urban settings by addressing the students" environment directly.

Chapter 8: Conclusion

Reflections

Sometimes the questions are complicated and the answers are simple – Dr. Seuss

This chapter is a reflection of the theories and theorists who have influenced me as a researcher, and a summary of my findings. I chose to conduct my research within the subject of science because of my background as a science teacher. I experienced how science education does not account for urban children in poverty (Calabrese-Barton, 2003; Emdin, 2008) and how the hidden curriculum (Apple, 2001) of science classes is to aid in the neo-liberal discourse of job preparation (Leathwood & O'Connell, 2003). Thus science students become the human capital to support the economy (Becker, 2006; Bourdieu, 2006; Taylor, 2004). My work illustrates how a focus on the students and the places in which they live can lead to feelings of empowerment, and more importantly (to me) a joy and enthusiasm for the subject of science. However, the work conducted could be applied to any subject. Science was merely the platform for the research.

The chosen methodology was constructivist grounded theory. CGT allowed me to focus on the context and the students, while acknowledging that multiple realities exist. It integrated my own subjectivity into the research as the research process was a social construction. Thus, I was able to improvise throughout the research process enabling me to collect what I deemed an appropriate amount of data to determine how to document the Super-Six's lives and learning processes. CGT is based on interaction between the researcher and researched, thus co-construction is possible. The Super-Six were not just observed but part of the process.

Utilising place (context) as my main concept allowed me to look beyond the individual to the bigger narratives at play in education, such as critical pedagogy and colonialism. Critical pedagogy provided the theoretical foundation. It enabled me to focus on a particular marginalised environment and the individuals within it. Critical Pedagogy allowed me to focus on the urban environment and the students living/working and studying there. Classifying the urban environment as a marginalised setting was heavily influenced by the work of post-colonial theorists.

Using Burbules and Berk's (1999) explanation of criticality forced me to explore the underlying influences that subjugate urban students, in particular the Super-Six. The Super-Six represented students who are marginalised not only by the place they occupy but also by those in authority around them. A pervasive neo-liberal (Leathwood & O'Connell, 2003) mentality in which accountability is key and blame is placed on those who are pushed to the margins means that there are and will be significant challenges in making science education meaningful and relevant for at-promise students. One such challenge is hope (Giroux, 2001; Taubman 2000).

Giroux (2001) and Taubman (2000) make a point that within classrooms hope is discussed as the neo-liberal desire for capitalism. My experience with the Super-Six supported this phenomenon. Each student hoped for a professional career, and not for aspirations such as self-improvement, knowledge etc. This meant that many of the Super-Six felt a hopelessness (Taubman, 2000) regarding their possibilities for the future because they sensed a lack of support from many of their teachers. As discussed by Apple (1993) power is embedded throughout education. For the Super-Six, the teachers and principal in their school where the agents of power. The students perceived a lack of encouragement and connection to many of those in power leading to the students believing their dreams, knowledge and experiences were worthless.

Freire (1989) discusses how many teachers support a banking model of education, and this was also supported by the Super-Six when discussing their science lessons. The Super-Six felt that their lessons were tedious, focused on a regurgitation of facts via textbooks and worksheets (Calabrese, 2003). The focus on textbooks as well as the lack of scientific equipment represents the inequality to access many urban students face (Apple, 2001). Freire (1989) discusses how a banking model of education creates a fragmented view of reality. A disconnection is formed between what at-promise students are taught, how they are taught and why they are taught. To address this fragmentation, the teacher/learner binary must shift. I found that this shift occurred with the Super-Six when a critical pedagogy of place became the focus (Gruenewald, 2003). As such, the starting point for my research was the understanding that the urban space is a place that can be seen as a colony and that those who live within it are colonised (Haymes, 1995).

As described by Haymes (1995) cities have a history of segregation. The students living/working and studying within the colony of the urban have their own language, purpose and drive (Moss, 2004). The youth living in the urban environment are not victims but instead live on the margin of the liminal space of the urban. In which "the margin is both a metaphorical and material space from which relationships of oppression might be reimagined and reshaped" (Gruenewald, p. 631, 2003b) what is known as reinhabitation. This is exactly what I realised in my research. As hooks (1990) explains the margins that surround a colonised space can be repurposed to enable reinhabitation. Through the process of working with the Super-Six, what became evident was that the borders of the urban were not significant.

It was at this point I took Bhabha's (1994) notion of liminal space and combined it with hooks (1990) contention that margins can be tools of transformation. First, I deconstructed the urban liminal space. I found that the bordered liminal space of the urban is in actuality comprised

of bordered liminal places (schools, homes, etc.). For instance, Hamlet School consisted of its own margins and borders, both physically (school walls) and mentally (not being allowed to stay in school after 3:05 p.m.). Brady's home had borders that meant that siblings shared rooms. Tara and Jaylyn lived in rental accommodations a car ride away. Each of these places within the liminal space of the urban is constituted by the borders that make it a place. For the students, these places are the focus of their lives: not the urban liminal space in a grand sense but the smaller, urban liminal places they occupy (leading to the creation of their multiple selves). While the Super-Six at times attempted to camouflage within the liminal space (Bhabha, 1994) they were not confined by the space (Roth, 2008). I concluded that for my research participants, the liminal is a **s/place**, in which places are flexible and ever changing (a reflection of their lives), which in turn encourages the creation of empowering relationships through the spaces between individuals. Relationships in this **s/place** are built on a foundation of trust, and thus set the groundwork for co-intentional education (Freire, 1989). The educational preference for my participants was self-directed learning with the opportunity for tactical guidance. Specifically, what was created was a curriculum of s/place.

A curriculum of s/place requires flexibility. While I recognise that predetermined and prescribed outcomes are now the norm for programs of study, a curriculum of s/place would provide the flexibility for the teacher and students to alter the outcomes, in order to become relevant for the place(s) in which learning is occurring – a critical pedagogy of place (Gruenewald, 2003). By allowing for flexibility in this sense, the spaces between the members of the learning environment becomes smaller. What occurs then is a learning that is both contextual and communal. Additionally, a curriculum of s/place requires a shift in the notion of-who is the teacher-and -who is the student. The teacher at times will need to step back and allow the

students to become both learner and educator, and take a role that is more that of a facilitator providing tactical guidance. The difficulty in this is that the emancipation of the student as just a learner requires the teacher to release the reins of control in the classroom. It requires trust on the part of both the learners and the teachers. It also requires the teacher to have a deep understanding of his or her role and the power he or she holds (Apple, 2001). This, I think, is the most challenging aspect of a curriculum of s/place. While the teacher I worked with was very interested in implementing my work with her entire class, she was apprehensive about allowing the students to have control over how and what they learn. For a curriculum of s/place to happen, this control needs to be reimagined. For me, students are the main players in their education. Thus, it seems only logical (to me) that they should have the biggest say in how and what they learn. Control is a tool of those in power. Giving youth in urban environments control over their learning will provide them with a sense of empowerment and feelings of pride in what they learn. A curriculum of s/place is, at its core, based on the program of studies (as was my work). The difference is in how the learning occurs: it is a direct move away from traditional deficit approaches to education (Freire, 1989) and even further than problem-based learning in the sense that the students are the individuals who make all of the decisions. A curriculum of s/place fosters relationships and relationship building. Finally, a curriculum of s/place requires flexibility in where learning can or should occur. Students in the 21st century live in chaos: life is fast and ever-changing, and their educational/learning environments must also encompass this flexibility. Learning does not need to occur solely in a classroom.

In my work, I merged both Roth's (2008) and Emdin's (2009) notions of third space. Taking Roth's (2008) focus on hybridity and fusing it with Emdin's emphasis on purpose. The Super-Six were hybrids (Roth, 2008), consisting of a multiplicity of selves. The spaces in which

we worked, had to allow for the expression of these hybrid selves, while acknowledging the culture of the urban environment. According to Emdin (2009) this third space can be any space found within the school environment that supports students' agency. As urban youth live a life in flux the third space for my work had to reflect this. The third space encouraged them to explore their interests (based on their hybrid selves) within the backdrop of places that were not in their formal science classroom. Thus while the locations in which we worked fluctuated, the purpose and people did not which resulted in a reduction of the boundaries between the students. Ultimately, what I discovered was that my third space allowed for a focus on relationships. When relationships become central and power is in the hands of the learners, where learning occurs becomes secondary, and the colonial nature of the urban classroom is negated.

The benefits of a curriculum of s/place are that education becomes integrally linked to the learner's life and world; the learner takes ownership and learning no longer becomes a "prize to be given out" based on merit. Rather, learning becomes a part of life. The challenges to a curriculum of s/place are multiple, and include the ability of the teachers/educators to release control, accessibility of resources, and a change in the structure of the classroom/school. I personally feel that the benefits of a curriculum of s/place far outweigh the challenges. If teachers see first-hand the change in their students, they are more likely to begin to take steps to break the binary between student and learner. If that happens, they are more likely to change the structure of where learning occurs.

The Super-Six can be seen as representatives of the millions of students living/working and studying in urban environments. As such, the aforementioned theory (curriculum of s/place) becomes a responsive pedagogical philosophy in which the students' culture (the urban) is contextualised within the teaching and learning process. By utilising this theory within similar

contexts, the possibility for culturally responsive pedagogy is not only plausible but, as my work illustrates, achievable. Hope is no longer dealt out as a prize, nor is it lost within the neo-liberal milieu, but rather it is discovered by those whom I feel are most important in the teaching and learning process: the students and youth themselves.

Ultimately, what I hope is that my work demonstrates that change is not only possible but achievable if we are open to listening to the voices of the unheard and often overlooked kids in our classrooms. My experience working with urban students has led me here, to the conclusion of this chapter of my life. The students of my past became the inspiration for my research, and the students of this project have become the inspiration for my future.

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APPENDIXES

Appendix A: Statistics Canada: Metropolitan Population Growth Rates

All data provided by Statistics Canada. I calculated the total change and yearly change using the data. All calculations shown here.

	Edmonton (AB)	Yearly Change	Total Change
2010	1183	----	
2011	1206	1.94%	1.94%
2012	1241.7	2.96%	4.96%
2013	1289.6	3.86%	9.01%
Average	**1230.075**	**2.92%**	**5.31%**

	Halifax (NS)	Yearly Change	Total Change
2010	398.3	----	
2011	402.4	1.03%	1.03%
2012	406.9	1.12%	2.16%
2013	408.7	0.44%	2.61%
Average	**404.075**	**0.86%**	**1.93%**

	Calgary (AB)		
2010	1240.2		
2011	1264.5	1.96%	1.96%
2012	1307.9	3.43%	5.46%
2013	1364.8	4.35%	10.05%
Average	**1294.35**	**3.25%**	**5.82%**

	Moncton (NB)		
2010	137.7		
2011	140.2	1.82%	1.82%
2012	142.8	1.85%	3.70%
2013	144.9	1.47%	5.23%
Average	**141.4**	**1.71%**	**3.58%**

	Saguenay (QC)		
2010	158.7		
2011	159.4	0.44%	0.44%
2012	160	0.38%	0.82%
2013	160.2	0.12%	0.95%
Average	**159.575**	**0.31%**	**0.74%**

	Saint John (NB)		
2010	128		
2011	128.6	0.47%	0.47%
2012	128.5	-0.08%	0.39%
2013	127.9	-0.47%	-0.08%
Average	**128.25**	**-0.03%**	**0.26%**

	Quebec (QC)		
2010	766.6	----	
2011	776.8	1.33%	1.33%
2012	785.2	1.08%	2.43%
2013	791.9	0.85%	3.30%
Average	**780.125**	**1.09%**	**2.35%**

	St Johns (NL)		
2010	198.4		
2011	202.5	2.07%	2.07%
2012	205.9	1.68%	3.78%
2013	208.4	1.21%	5.04%
Average	**203.8**	**1.65%**	**3.63%**

	Sherbrooke (QC)		
2010	201.7		
2011	204.7	1.49%	1.49%
2012	207.5	1.37%	2.88%
2013	210	1.20%	4.12%
Average	**205.975**	**1.35%**	**2.83%**

	Ottawa (ON-QC)		
2010	1250.6	----	
2011	1270.2	1.57%	1.57%
2012	1288.7	1.46%	3.05%
2013	1305.2	1.28%	4.37%
Average	**1278.675**	**1.43%**	**2.99%**

	Trois-Rivieres (QC)		
2010	151.9		
2011	153.2	0.86%	0.86%
2012	154.4	0.78%	1.65%
2013	155	0.39%	2.04%
Average	**153.625**	**0.68%**	**1.51%**

	Kingston (ON)		
2010	162.9		
2011	164.5	0.98%	0.98%
2012	166	0.91%	1.90%
2013	167.2	0.72%	2.64%
Average	**165.15**	**0.87%**	**1.84%**

	Montreal (QC)		
2010	3842.8		
2011	3885.7	1.12%	1.12%
2012	3936.9	1.32%	2.45%
2013	3981.8	1.14%	3.62%
Average	**3911.8**	**1.19%**	**2.39%**

	Peterborough (ON)		
2010	121.9		
2011	122.2	0.25%	0.25%
2012	122.7	0.41%	0.66%
2013	123.1	0.33%	0.98%
Average	**122.475**	**0.33%**	**0.63%**

	Oshawa (ON)		
2010	362.3		
2011	367.3	1.38%	1.38%
2012	373.8	1.77%	3.17%
2013	380	1.66%	4.89%
Average	**370.85**	**1.60%**	**3.15%**

	Toronto (ON)	Yearly Change	Total Change
2010	5681.7	----	
2011	5769.8	1.55%	1.55%
2012	5870	1.74%	3.31%
2013	5959.5	1.52%	4.89%
Average	**5820.25**	**1.60%**	**3.25%**

	Barrie (ON)	Yearly Change	Total Change
2010	190.8	----	
2011	192.8	1.05%	1.05%
2012	195.4	1.35%	2.41%
2013	197.8	1.23%	3.67%
Average	**194.2**	**1.21%**	**2.38%**

	Hamilton (ON)		
2010	736.1		
2011	742.5	0.87%	0.87%
2012	750.8	1.12%	2.00%
2013	758.1	0.97%	2.99%
Average	**746.875**	**0.99%**	**1.95%**

	Greater Sudbury (ON)		
2010	165.2		
2011	165.3	0.06%	0.06%
2012	165.5	0.12%	0.18%
2013	165.5	0.00%	0.18%
Average	**165.375**	**0.06%**	**0.14%**

	St. Catharines-Niagara (ON)		
2010	402		
2011	402.6	0.15%	0.15%
2012	404.1	0.37%	0.52%
2013	405	0.22%	0.75%
Average	**403.425**	**0.25%**	**0.47%**

	Thunder Bay (ON)		
2010	125.1		
2011	125	-0.08%	-0.08%
2012	125.1	0.08%	0.00%
2013	125.1	0.00%	0.00%
Average	**125.075**	**0.00%**	**-0.03%**

	Kitchener-Cambridge-Waterloo (ON)		
2010	487.2		
2011	493	1.19%	1.19%
2012	499	1.22%	2.42%
2013	504.3	1.06%	3.51%
Average	**495.875**	**1.16%**	**2.37%**

	Winnipeg (MB)		
2010	736.4		
2011	746.1	1.32%	1.32%
2012	759.3	1.77%	3.11%
2013	771.2	1.57%	4.73%
Average	**753.25**	**1.55%**	**3.05%**

	Brantford (ON)		
2010	138.5	----	
2011	139.4	0.65%	0.65%
2012	140.4	0.72%	1.37%
2013	141.3	0.64%	2.02%
Average	**139.9**	**0.67%**	**1.35%**

	Regina (SK)		
2010	213.5	----	
2011	217	1.64%	1.64%
2012	225	3.69%	5.39%
2013	232.1	3.16%	8.71%
Average	**221.9**	**2.83%**	**5.25%**

	Guelph (ON)		
2010	144.2		
2011	145.6	0.97%	0.97%
2012	148.1	1.72%	2.70%
2013	150.3	1.49%	4.23%
Average	**147.05**	**1.39%**	**2.64%**

	Saskatoon (SK)		
2010	262.9		
2011	270	2.70%	2.70%
2012	281.5	4.26%	7.07%
2013	292.6	3.94%	11.30%
Average	**276.75**	**3.63%**	**7.02%**

	London (ON)		
2010	486.1		
2011	489.5	0.70%	0.70%
2012	494.5	1.02%	1.73%
2013	498.6	0.83%	2.57%
Average	**492.175**	**0.85%**	**1.67%**

	Kelowna (BC)		
2010	181.4		
2011	183.5	1.16%	1.16%
2012	185.7	1.20%	2.37%
2013	186.3	0.32%	2.70%
Average	**184.225**	**0.89%**	**2.08%**

	Windsor (ON)		
2010	328.2		
2011	328.3	0.03%	0.03%
2012	331	0.82%	0.85%
2013	333.1	0.63%	1.49%
Average	**330.15**	**0.50%**	**0.79%**

	Abbotsford-Mission (BC)		
2010	172.7		
2011	174.3	0.93%	0.93%
2012	176.7	1.38%	2.32%
2013	177.5	0.45%	2.78%
Average	**175.3**	**0.92%**	**2.01%**

	Vancouver (BC)	Yearly Change	Total Change
2010	2344.3		
2011	2373	1.22%	1.22%
2012	2408.7	1.50%	2.75%
2013	2443.3	1.44%	4.22%
Average	**2392.325**	**1.39%**	**2.73%**

	Victoria (BC)		
2010	351.2		
2011	352.1	0.26%	0.26%
2012	355.2	0.88%	1.14%
2013	357.3	0.59%	1.74%
Average	**353.95**	**0.58%**	**1.04%**

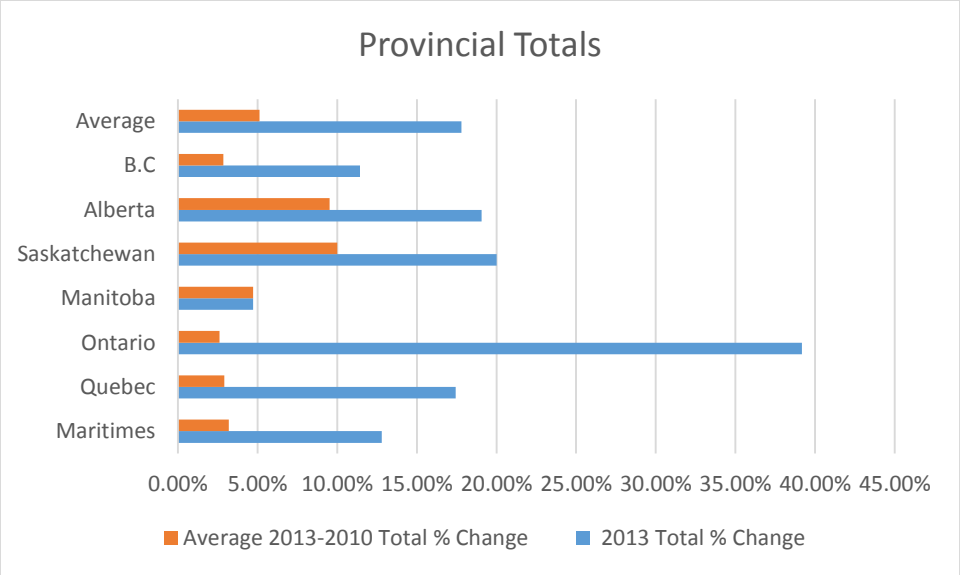
Appendix B: Summary Tables of Population Change

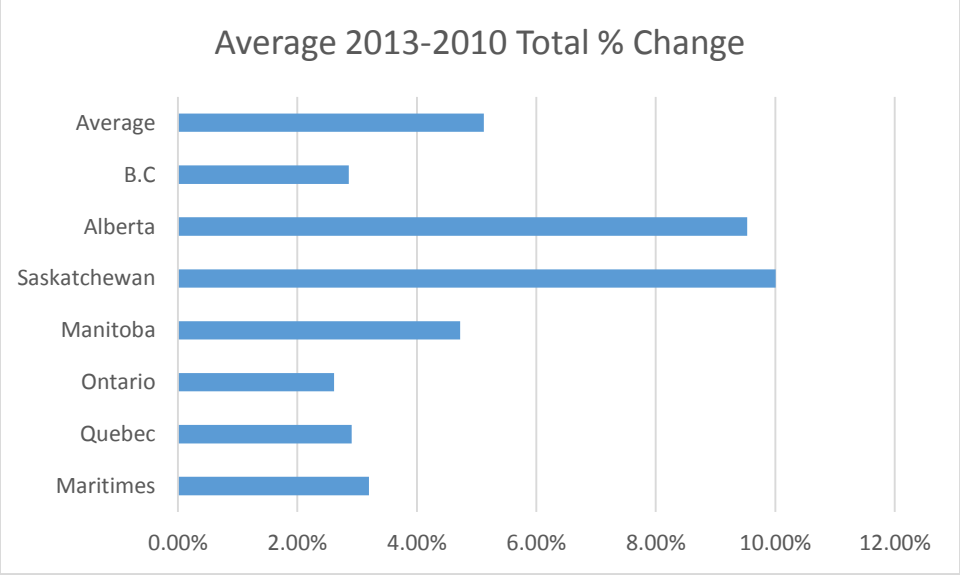
Province	Average 2013-2010 Total % Change
Maritimes	3.20%
Quebec	2.91%
Ontario	2.61%
Manitoba	4.73%
Saskatchewan	10.00%
Alberta	9.53%
B.C	2.86%
Average	**5.12%**

Province	2013 Total % Change
Maritimes	12.80%
Quebec	17.44%
Ontario	39.18%
Manitoba	4.73%
Saskatchewan	20.01%
Alberta	19.06%
B.C	11.44%
Average	**17.81%**

Appendix C: Statistics Canada: Population Growth Rate Graphs

Graphs I created using calculations of percentage change.





Appendix C: Hamlet School Profile

School Profile -- as of Oct 31, 2013

(Generated Nov 28, 2013)

EDMONTON PUBLIC SCHOOL: Hardisty (512) - Elementary/Junior High - *10534 - 62 Street NW*

Viability Benchmark for each category in brackets ()

STUDENT ENROLMENT 2013/14

Number of Students Per Grade:					Elementary 338 (140)			Jr High 272 (150)			Sr High 0 (400)			
EE	*K*	*Gr.1*	*Gr.2*	*Gr.3*	*Gr.4*	*Gr.5*	*Gr.6*	*Gr.7*	*Gr.8*	*Gr.9*	*Gr.10*	*Gr.11*	*Gr.12*	*TOTAL*
0	48	40	44	39	52	56	59	82	106	84	0	0	0	610

Student Enrolment by Program:

	Regular	*ALT(Logos)*	*District Centre*	*Early Ed*	*Total*
Elementary	206 (140)	128 (140)	6	0	340
Junior High	181 (150)	74 (150)	17	0	272

District Centre: Community Learning Skills; Community Lrng Skills/Behavior & Lrng Assist; Individual Support ***Note: Program Enrolment counts reflect cases where students are enrolled in more than one program*

Student Enrolment at Entry Level:

Elementary (034)		Jr High (050)	Sr High (135)
K	*Gr.1*	*Gr.7*	*Gr.10*
48	40	82	0

Historical Enrolment:

2009	*2010*	*2011*	*2012*	*2013*	
397	672	667	632	610	53.7% Overall %Increase from 2009

EDMONTON PUBLIC SCHOOL POPULATION

227	Total Number of EPSB Elementary Students Residing in Hardisty Attendance Area (280)
119	Total Number of EPSB Elementary Students Residing in Hardisty Attendance Area Attending Hardisty (140)
292	Total Number of EPSB Jr High Students Residing in Hardisty Attendance Area (300)
139	Total Number of EPSB Jr High Students Residing in Hardisty Attendance Area Attending Hardisty (150)

STUDENT SPACE AND COST

650	Provincially Adjusted Student Enrolment		
56%	Percentage of Student Space Occupied (50%)	509	Number of Unfunded Student Spaces
1159	Provincial ACU School Capacity	$393,579.16	Cost of Unfunded Student Space
878	ACOL School Capacity		
0	Number of Portable Classrooms on Site		

LOCATION AND ACCESSIBILITY

3	Number of EPSB Schools within a 1.6 km radius (3)				
6322	Number of Unfunded Student Spaces in the Sector	SOUTH CENTRAL	Sector	G	Ward

Existing Leases in the School: CAPILANO PLAYSCHOOL ASSOCIATION - 64 m2; FULTON CHILD CARE ASSOCIATION - 99 m2; HARDISTY GYMNASTICS CLUB - 8.2 m2; YOUNG LIFE OF CANADA - 18.88 m2;

Facility Information and Condition

1956	Year School was Built	57%	Provincial Utilitization Rate (2012-2013)
Good	Provincial Facility Condition Index Rating (Good, Fair, Poor)		

The unfunded space calculation for this school is an approximation based on an average per pupil Plant Operation and Maintenance allocation

Appendix D: 2014_2012_2009_Census _Results_Comparison

	2014	2012	2009
Total Population	**877,926**	**817,498**	**782,439**
Total Dwellings	**376,416**	**354,190**	**340,410**

Age and Gender Distribution

	2014						2012						2009					
Age Group	**Female**	**% Female**	**Male**	**% Male**	**Total**	**% Total**	**Female**	**% Female**	**Male**	**% Male**	**Total**	**% Total**	**Female**	**% Female**	**Male**	**% Male**	**Total**	**% Total**
0 - 4	21,559	6.0%	22,668	6.3%	44,227	6.1%	20,188	5.6%	21,021	5.8%	41,209	5.7%	19,395	5.8%	19,820	5.9%	39,215	5.9%
5 - 9	20,398	5.6%	21,008	5.8%	41,406	5.7%	18,223	5.0%	19,036	5.3%	37,259	5.2%	17,714	5.3%	18,601	5.5%	36,315	5.4%
10 - 14	18,577	5.1%	19,589	5.4%	38,166	5.3%	17,764	4.9%	18,323	5.1%	36,087	5.0%	18,724	5.6%	19,700	5.9%	38,424	5.7%
15 - 19	20,100	5.6%	21,171	5.9%	41,271	5.7%	19,769	5.5%	20,358	5.7%	40,127	5.6%	21,778	6.5%	22,638	6.8%	44,416	6.6%
20 - 24	26,557	7.3%	27,549	7.6%	54,106	7.5%	27,050	7.5%	27,742	7.7%	54,792	7.6%	29,874	8.9%	30,193	9.0%	60,067	9.0%
25 - 29	30,865	8.5%	31,802	8.8%	62,667	8.7%	29,001	8.0%	30,591	8.5%	59,592	8.3%	29,685	8.9%	31,383	9.4%	61,068	9.1%
30 - 34	30,340	8.4%	31,104	8.6%	61,444	8.5%	27,006	7.5%	28,328	7.9%	55,334	7.7%	25,751	7.7%	27,247	8.1%	52,998	7.9%
35 - 39	26,328	7.3%	27,282	7.6%	53,610	7.4%	23,651	6.5%	24,514	6.8%	48,165	6.7%	23,828	7.1%	24,868	7.4%	48,696	7.3%
40 - 44	23,844	6.6%	25,041	7.0%	48,885	6.8%	22,799	6.3%	23,568	6.5%	46,367	6.4%	24,091	7.2%	24,820	7.4%	48,911	7.3%
45 - 49	23,875	6.6%	24,324	6.8%	48,199	6.7%	23,781	6.6%	24,134	6.7%	47,915	6.6%	26,441	7.9%	26,326	7.9%	52,767	7.9%
50 - 54	25,856	7.1%	25,609	7.1%	51,465	7.1%	24,607	6.8%	24,523	6.8%	49,130	6.8%	25,049	7.5%	25,446	7.6%	50,495	7.5%
55 - 59	24,255	6.7%	24,055	6.7%	48,310	6.7%	21,548	6.0%	21,914	6.1%	43,462	6.0%	19,779	5.9%	19,955	6.0%	39,734	5.9%
60 - 64	19,410	5.4%	18,801	5.2%	38,211	5.3%	16,533	4.6%	16,322	4.5%	32,855	4.6%	15,244	4.6%	14,928	4.5%	30,172	4.5%
65 - 69	14,795	4.1%	13,694	3.8%	28,489	3.9%	12,295	3.4%	11,538	3.2%	23,833	3.3%	11,365	3.4%	10,225	3.1%	21,590	3.2%
70 - 74	11,024	3.0%	9,363	2.6%	20,387	2.8%	9,616	2.7%	8,337	2.3%	17,953	2.5%	9,755	2.9%	8,334	2.5%	18,089	2.7%
75 - 79	8,963	2.5%	7,134	2.0%	16,097	2.2%	8,239	2.3%	6,536	1.8%	14,775	2.0%	8,849	2.6%	7,075	2.1%	15,924	2.4%
80 - 84	7,245	2.0%	5,392	1.5%	12,637	1.8%	6,595	1.8%	5,069	1.4%	11,664	1.6%	6,576	2.0%	4,652	1.4%	11,228	1.7%
85+	7,713	2.1%	4,537	1.3%	12,250	1.7%	5,662	1.6%	3,370	0.9%	9,032	1.3%	6,160	1.8%	3,785	1.1%	9,945	1.5%
No Response	72,816	n/a	83,283	n/a	156,099	n/a	70,272	n/a	77,675	n/a	147,947	n/a	48,068	n/a	54,317	n/a	102,385	n/a
Total	434,520	100.0%	443,406	100.0%	877,926	100.0%	404,599	92.4%	412,899	93.1%	817,498	92.8%	388,126	101.7%	394,313	101.4%	782,439	101.6%

Length of Residence At Present Address

	2014		2012		2009
Category	**Total**	**% Total**	**Total**	**% Total**	
5+	357,208	48.4%	344,005	48.9%	Information Not Collected
3 - < 5	124,666	16.9%	113,738	16.2%	
1 - < 3	135,841	18.4%	123,912	17.6%	
< 1 year	111,627	15.1%	112,684	16.0%	
Child < 1 year	8,467	1.1%	8,777	1.2%	
No Response	140,117	n/a	114,382	n/a	
Total	877,926	100.0%	817,498	100.0%	

If Less Than One Year At Present Address

	2014		2012		2009
Category	**Total**	**% Total**	**Total**	**% Total**	
Elsewhere in Edmonton	66,942	65.1%	69,340	67.2%	Information Not Collected
Elsewhere in Alberta	13,034	12.7%	14,709	14.3%	
Atlantic Canada	1,499	1.5%	1,366	1.3%	
Ontario or Quebec	6,473	6.3%	4,355	4.2%	
Territories/MB/SK	2,124	2.1%	1,892	1.8%	
British Columbia	3,473	3.4%	3,628	3.5%	
Outside of Canada	9,239	9.0%	7,918	7.7%	
No Response	8,843	n/a	9,476	n/a	
Total	111,627	100.0%	112,684	100.0%	

Marital Status

	2014		2012		2009
Category	**Total**	**% Total**	**Total**	**% Total**	
Common Law	48,252	6.5%	44,025	6.2%	Information Not Collected
Married	302,434	40.8%	284,048	40.3%	
Never Married	315,996	42.6%	304,125	43.2%	
Separated/Divorced	48,674	6.6%	46,840	6.7%	
Widowed	26,683	3.6%	25,572	3.6%	
No Response	135,887	n/a	112,888	n/a	
Total	877,926	100.00%	817,498	100.00%	

Ownership

	2014		2012		2009	
Category	**Amount**	**Percentage**	**Amount**	**Percentage**	**Amount**	**Percentage**
Owned	195,560	63.0%	191,498	61.0%	193,136	61.5%
Rented	115,093	37.0%	122,675	39.0%	122,740	39.1%
No Response	47,583	n/a	24,042	n/a	3,121	n/a
Total	358,236	100.0%	338,215	100.0%	318,997	100.5%

Employment Status

	2014		2012		2009
Category	Total	% Total	Total	% Total	
0 - 30 Hrs	50,538	6.8%	45,600	6.3%	Information Not Collected
30+ Hrs	353,054	47.4%	332,556	46.2%	
Homemaker	30,158	4.0%	27,698	3.8%	
Retired	90,857	12.2%	86,484	12.0%	
Unemployed	22,541	3.0%	19,456	2.7%	
Preschool	41,194	5.5%	46,529	6.5%	
Kind. - Gr.6	58,402	7.8%	53,960	7.5%	
Gr.7 - Gr.9	23,996	3.2%	23,397	3.3%	
Gr.10 - Gr.12	24,324	3.3%	24,145	3.4%	
Post Sec. Studnt	38,689	5.2%	45,507	6.3%	
Permanently Unable to Work	11,234	1.5%	8,573	1.2%	
Other	n/a	n/a	5,786	0.8%	
No Response	132,939	n/a	97,807	n/a	
Total	877,926	100.0%	817,498	100.0%	

** Other was not offered as a response in 2014*

Citizenship

	2014		2012		2009
Category	Total	% Total	Total	% Total	
Canadian	659,154	88.1%	663,572	90.8%	Information Not Collected
Non Canadian	88,907	11.9%	67,254	9.2%	
No Response	129,865	n/a	86,672	n/a	
Total	877,926	100.0%	817,498	100.0%	

School District Residency

	2014		2012		2009
Category	Total	% Total	Total	% Total	
Edmtn Catholic	179,708	26.4%	173,533	25.5%	Information Not Collected
Edmtn Public	501,744	73.6%	507,475	74.5%	
No Response	196,474	n/a	136,490	n/a	
Total	877,926	100.0%	817,498	100.0%	

Structure Type

	2014		2012		2009	
Category	Amount	Percentage	Amount	Percentage	Amount	Percentage
Single Detatched	195,486	50.3%	185,259	50.4%	178,888	50.0%
Apt. + 5 stories	35,446	9.1%	34,153	9.3%	34,330	9.6%
Apt. < 5 Stories	88,655	22.8%	85,014	23.1%	82,790	23.1%
Duplex/Triplex	26,186	6.7%	23,845	6.5%	25,858	7.2%
Hotel or Motel	162	0.0%	182	0.0%	115	0.0%
Manufactured Home	2,946	0.8%	2,941	0.8%	3,098	0.9%
Institution/Collective Residence	4,741	1.2%	4,460	1.2%	2,894	0.8%
Row House	34,647	8.9%	31,697	8.6%	27,440	7.7%
RV/Tent/Other	206	0.1%	196	0.1%	2,642	0.7%
Total	388,475	100.0%	367,747	100.0%	357,855	100.0%

Dwelling Unit and Property Status

	2014		2012		2009	
Status	Amount	Percentage	Amount	Percentage	Amount	Percentage
Occupied	358,236	95.2%	338,215	95.5%	318,997	93.7%
Not Occupied	18,180	4.8%	15,975	4.5%	21,413	6.3%
Sub Total	*376,416*		*354,190*		*340,410*	
Under Contruction	n/a		5,479		3,889	
No Longer In Use	12,059		8,078		11,051	
Vacant Lot	n/a		1,198		2,505	
Total	388,475	100.0%	368,945	100.0%	357,855	100.0%

Main Mode of Transportation from Home to Work

	2014		2012		2009
	Amount	Percentage	Amount	Percentage	
Car/Truck/Van (as Driver)	325,994	69.9%	289,863	75.5%	Information Not Collected
Car/Truck/Van (as Passenger)	29,145	6.2%	14,830	3.9%	
Transit	76,706	16.4%	52,818	13.8%	
Walk	17,048	3.7%	13,525	3.5%	
Bicycle	3,770	0.8%	2,569	0.7%	
Other	13,906	3.0%	7,201	1.9%	
No Response	144631 *	n/a	3,136	0.8%	
Total	466,569	100.0%	383,942	100.0%	

** Question adjusted in 2014 to ask anyone over the age of 12*

Household Languages

	2014		2012	2009
	Amount	Percentage		
English Only	200,189	68.9%	Information Not Collected	Information Not Collected
Arabic	4,898	1.7%		
Cantonese	7,875	2.7%		
French	10,457	3.6%		
German	3,548	1.2%		
Mandarin	5,815	2.0%		
Panjabi (Punjabi)	6,333	2.2%		
Spanish	5,341	1.8%		
Tagalog (Pilipino, Filipino)	9,328	3.2%		
Ukrainian	3,869	1.3%		
Other	32,964	11.3%		
No Response	67,619	n/a		
Total	358,236	100.0%		

City Resource Access

	2014		2012	2009
	Amount	Percentage		
City Website	166,281	25.3%	Information Not Collected	Information Not Collected
311 Phone In	74,118	11.3%		
Newspapers	94,246	14.3%		
Radio	77,120	11.7%		
Community Newsletter	40,320	6.1%		
Social Media	61,925	9.4%		
In Person	18,433	2.8%		
Billboards	31,159	4.7%		
Pamphlets	46,950	7.1%		
Other	46,324	7.1%		
No Response	73,285	n/a		
Total	730,161	100.0%		

Future City Resource Access

	2014		2012	2009
	Amount	Percentage		
City Website	1,470	8.4%	Information Not Collected	Information Not Collected
311 Phone In	692	4.0%		
Newspapers	415	2.4%		
Radio	382	2.2%		
Community Newsletter	856	4.9%		
Social Media	611	3.5%		
- Facebook	189	1.1%		
- Twitter	198	1.1%		
In Person	201	1.1%		
Billboards	111	0.6%		
Pamphlets	892	5.1%		
Other				
- Television/TV	2,577	14.7%		
- News Channels	2,035	11.6%		
- Cell Phone/mobile APP	594	3.4%		
- Youtube	12	0.1%		
- Texts	368	2.1%		
- Department Directories	10	0.1%		
- mail (letter)	881	5.0%		
- Email (letter)	4,933	28.2%		
- Correspondence from Councillor	4	0.0%		
- Automated telephone messages	68	0.4%		
- Public Forums	2	0.0%		
Total	17,501	100.0%		

** Question asked only online, and was free form text entry. Above results grouped based on similar responses*

Appendix E: Unit Background Information

Unit E: Freshwater and Saltwater Systems

Key Concepts

The following concepts are developed in this unit and may also be addressed in other units at other grade levels. The intended level and scope of treatment is defined by the outcomes below.

− water quality − water-borne materials − erosion and deposition − stream characteristics − continental drainage systems − ocean basins − climate − glaciers and icecaps − adaptations to aquatic ecosystems − human impact

STS

1. Describe the distribution and characteristics of water in local and global environments, and identify the significance of water supply and quality to the needs of humans and other living things

• describe, in general terms, the distribution of water in Alberta, Canada and the world; and interpret information about water characteristics (e.g., identify glaciers, snow, polar icecaps, ground water and oceans as components of Earth's water; interpret graphical information on the availability of potable water)

- Is anyone here from somewhere else in Alberta, Canada or the world?
- Has anyone visited anywhere else in the world?
- What is water like in these places? Where does the water come from? How much water is there to drink?

• recognize that fresh water and salt water contain varying amounts of dissolved materials, particulates and biological components; and interpret information on these component materials

- What kind of water is in your neighbourhood, salt or freshwater? How can you find out?

• identify major factors used in determining if water is potable, and describe and demonstrate tests of water quality (e.g., investigate and describe the physical characteristics of a sample of water, such as clarity, salinity and hardness; investigate biological tests)

- What makes good drinking water? How can you find out?

• describe, in general terms, methods for generating fresh water from salt water, based on evaporation, distillation and reverse osmosis

2. Investigate and interpret linkages among landforms, water and climate

• describe the processes of erosion and deposition resulting from wave action and water flow, by:

− identifying dissolved solids and sediment loads, and identifying sources and endpoints for these materials − describing how waves and tides are generated and how they interact with shorelines

- How can we learn about erosion in your neighbourhood?
- What does erosion mean? Is it important to understand or learn about?
- What is erosion? Is there erosion in your neighbourhood? How can you tell? Where is it all going?

• investigate and describe stream characteristics (e.g., describe the slope, flow rate and stream profile characteristics of a model stream on a stream table)

3. Analyze factors affecting productivity and species distribution in marine and freshwater environments

• investigate life forms found in fresh water and salt water, and identify and interpret examples of adaptations to these environments (e.g., describe and interpret examples of fish and invertebrate species found in a local freshwater environment)

• analyze factors that contribute to the development of adaptations in species found in saltwater and freshwater environments

- Do you have a fish tank? What kind of water is in it? What kind of animals live there? Why can these animals live in this type of water? What would happen if they went into a different kind of water? What other animals could live in your tank?

4. Analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues

• analyze human water uses, and identify the nature and scope of impacts resulting from different uses (e.g., identify pollutants in ground water and surface water systems resulting from domestic and industrial use; analyze the effects of agriculture and forestry practices on stream flow and water quality)

- When it rains in your neighbourhood where does the water go? When you wash your car, bike, lawn? What is in the water when it leaves your house? Why does this matter?

• identify current practices and technologies that affect water quality, evaluate environmental costs and benefits, and identify and evaluate alternatives (e.g., research and analyze alternatives for ensuring safe supplies of potable water; research, analyze and debate alternatives for a specific water quality issue, such as the location and design of a landfill, the protection of a natural waterway, the use of secondary and tertiary wastewater treatment, the salinization of soils due to irrigation, the eutrophication of ponds and streams due to excess use of phosphates in fertilizers and detergents, or a proposal to export water resources)

- Does the water in your tap ever smell funny? Why do you think that?
- Where is the closest landfill to your house? Can that affect your drinking water?
- The Edmonton Power Plant, what is the purpose? Why is it important?
- Do you know anyone that has a pool, or do you go to one outside? What is the green fuzz on it?

• provide examples of problems that cannot be solved using scientific and technological knowledge alone (e.g., the need to prevent pollutants from entering aquatic environments, the need to avoid damage from ice sheets and icebergs)

- Are there any water problems in your neighbourhood/home? Can they be solved? How?
- Have you seen the add “store it don’t pore it” City of Edmonton, why are they telling us this?

Skill Outcomes

Initiating and Planning

Ask questions about the relationships between and among observable variables, and plan investigations to address those questions

• identify science-related issues and problems

• identify questions to investigate, arising from science-related issues

• select appropriate methods and tools for collecting relevant data and information (e.g., plan and conduct a search, using a wide variety of electronic sources) characteristics of two water samples)

- Is it important to know how much water is used in your home? How can you find out how much water you use in your home? Can you create a plan and do it?
- How much water is used in ...

Performing and Recording

Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data

- research information relevant to a given issue

• select and integrate information from various print and electronic sources or from several parts of the same source (e.g., summarize information on a river basin)

• identify strengths and weaknesses of different methods of collecting and displaying data (e.g., identify strengths and weaknesses of technologies used to monitor and map changes in stream flow)

Analyzing and Interpreting

Analyze qualitative and quantitative data, and develop and assess possible explanations

• apply given criteria for evaluating evidence and sources of information (e.g., assess the authenticity and reliability of electronic sources)

• predict the value of a variable, by interpolating or extrapolating from graphical data (e.g., predict future stocks of fish based on long-term data)

• interpret patterns and trends in data, and infer and explain relationships among the variables (e.g., relate climates to proximity to oceans and to the characteristics of ocean currents)

• identify new questions and problems arising from what was learned (e.g., identify questions, such as: “Can ocean currents be modified?”, “Is kelp a viable source of food?”, “How would icecap melting change Canadian coastlines?”)

Communication and Teamwork

Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results

• use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures and results (e.g., use such terms as salinity, currents and basins when describing oceans and their characteristics)

• communicate questions, ideas, intentions, plans and results, using lists, notes in point form, sentences, data tables, graphs, drawings, oral language and other means (e.g., create a concept map, linking the different stages of the water cycle; prepare a multimedia presentation on changing climatic conditions and the effects on glaciers, ice sheets and water levels, incorporating graphics, audio, visuals and text gathered from remote sources)

• evaluate individual and group processes used in planning, problem solving, decision making and completing a task (e.g., discuss advantages and disadvantages of different research methods and sources used to gather information on an ocean basin)

• defend a given position on an issue, based on their findings

Attitude Outcomes

Interest in Science

Students will be encouraged to: Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., express interest in conducting scientific investigations of their own design; take an interest in media reports on environmental issues, and seek out further information from a variety of sources; take an interest in observing and interpreting their environment during personal and group excursions)

Mutual Respect

Students will be encouraged to: Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show awareness of and respect for the contributions of indigenous peoples to knowledge of the environment)

Scientific Inquiry

Students will be encouraged to: Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., seek data that is accurate and based on appropriate methods of investigation; consider observations and ideas from a number of sources before drawing conclusions)

Collaboration

Students will be encouraged to: Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., share observations and ideas with other members of a group, and consider alternative ideas suggested by other group members; share the responsibility for carrying out decisions)

Stewardship

Students will be encouraged to: Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., consider immediate and long-term consequences of personal and group actions; objectively identify potential conflicts between responding to human wants and needs and protecting the environment)

Safety

Students will be encouraged to: Show concern for safety in planning, carrying out and reviewing activities (e.g., select safe methods and tools for collecting evidence and solving problems; readily alter a procedure to ensure the safety of members of the group)

Appendix F: Created Questions for Students

Unit E: Freshwater and Saltwater Systems

- Is anyone here from somewhere else in Alberta, Canada or the world?
- Has anyone visited anywhere else in the world?
- What is water like in these places? Where does the water come from? How much water is there to drink?
- What kind of water is in your neighbourhood, salt or freshwater? How can you find out?
- What makes good drinking water? How can you find out?
- How can we learn about erosion in your neighbourhood?
- What does erosion mean? Is it important to understand or learn about?
- What is erosion? Is there erosion in your neighbourhood? How can you tell? Where is it all going?
- Do you have a fish tank? What kind of water is in it? What kind of animals live there? Why can these animals live in this type of water? What would happen if they went into a different kind of water? What other animals could live in your tank?
- When it rains in your neighbourhood where does the water go? When you wash your car, bike, lawn? What is in the water when it leaves your house? Why does this matter?
- Does the water in your tap ever smell funny? Why do you think that?
- Where is the closest landfill to your house? Can that affect your drinking water?
- The Edmonton Power Plant, what is the purpose? Why is it important?
- Do you know anyone that has a pool, or do you go to one outside in the summer? What is the green fuzz on it?
- Are there any water problems in your neighbourhood/home? Can they be solved? How?
- Have you seen the add “store it don’t pore it” City of Edmonton, why are they telling us this?
- Is it important to know how much water is used in your home? How can you find out how much water you use in your home? Can you create a plan and do it?
- How much water is used in ...

Appendix G: Student Survey

This survey is anonymous which means you will not put your name on the survey and no one will be able to track the answers directly to you. So please answer all questions that you are comfortable with.

Thinking about your science class, how much do you agree or disagree with the following questions? For each statement, please check the appropriate box.

	A Strongly Disagree	B Somewhat Disagree	C Somewhat Agree	D Strongly Agree
1. I find science class boring				
2. I find science class interesting				
3. I can use what I learn in science in my life outside of school				
4. Students in my class treat one another with respect.				
5. Most of my teachers don't understand what my life is like outside of school.				
6. I feel safe in my classes.				
7. I feel safe outside of the classroom (restrooms, lockers, hallways, cafeteria, etc.).				
8. My school respects all races and cultures.				
9. My class respects all races and cultures				

10. I really want to learn.				
11. I participate regularly in class.				
12. I have time at home to finish my homework				
13. I often need extra help with schoolwork.				
14. It's often hard to pay attention in class because I'm worrying about problems outside of school.				
15. I think science is important to my life outside of school				
16. I am looking forward to taking science in high school				
17. I want to be in a science related job when I finish high-school				

How well do each of the following statements describe you? Put a tick in the box

	A Yes	B No
18. Have you ever skipped class or school?		
19. Have you ever considered dropping out of school?		

If you answered "yes", please indicate how often have you ever skipped a class or school or considered dropping out of school because of any of the below reasons?

	A Never	B Once or Twice	C A Few Times a Year	D Several Times a Year
20. You did not feel prepared for class.				
21. You did not feel safe at school.				
22. You did not feel safe in class				
23. You did not feel safe traveling to and from school.				
24. class was boring				
25. You had family responsibilities.				

How much would the following steps help you to learn? Tick the box

	A Help a Lot	B Help a Little	C Not At All
26. More one-on-one attention from teachers.			
27. More examples of how the things I learn in school matter in the real world.			
28. If other students were more accepting of me.			

GENERAL INFORMATION

29. Do your parents usually speak a language other than	A	B

English at home?	Yes	No
30. If you want please write your ethnicity		

1. How do you define the inner-city in Edmonton?

_____

2. Think of the best science lesson you have had. What made it a great lesson?

_____

3. What would you like to see in your science class to make it better connected to your life outside of school?

_____

Appendix H: Meeting Dates

January

January 17th Approval by EPSB confirmed

February

Feb 8th first meeting with teacher

Feb 21st – email check in regarding starting

March

March 20 – check in with George about switching sites, sent Kristi email confirming interest/disinterest. She confirmed set a date for coming in.

April

1. Friday, April 12th 1:15-2:04 (45 min)
2. Friday, April 19th 1:15-2:04 (45 min)

I was in San Francisco for the rest of April

May

3. Friday, May 3rd 1:15-2:04 (45 min)
4. Thursday, May 9th 8:30 – 9:15 (45 min)
5. Friday, May 17th 1:15-2:04 (45 min)
6. Friday, May 24th 1:15-2:04 (45 min)

May 31- I was invited to come but wanted a break between their session on equipment and coming to the university. Also I was leaving on the 1st and needed one day to work. I was also invited for the 30th but was working at Ed Tech at the requested time.

June

7. Friday, June 7th – University 12:30 – 2:30 (2 hours)
8. Monday, June 16th 12:30-1:15 (45 min)

Total focus group sessions 8

Appendix I: Excerpts from Field Notes

May 24st

Went to site for normal block 1:15, met with the principal prior to discuss the opportunity to bring students to the school on a field trip. He did not sit behind the desk and we chatted about the purpose of the trip – how it is it try to give the kids a different experience. He was all for it and decided to clear a day Friday the 7th worked.

I then went up to the class and they had a sub as their teacher was in a field trip camping. I chatted with the sub, she was unaware that I was coming, the class was doing a quiz and I confirmed that my students were not doing it, who they were and we generally chatted about teaching, her experience etc. Hami, Jayleen, Yasmina, Brad were all present I made them check in with their teacher and then we left. Yasmina informed me that Taylor was in the hospital with appendicitis. Rhyse came to the room as we were leaving, so I had him go back and check-in. They came in and we went to the computer lab, which as not booked as another class was there. The teacher was okay with us taking a few but the kids wanted to check the other lab, they did not want to share. However the other room was also booked and no extra seats so we went back upstairs to the original computer room. There were only 4 computers available. Rhyse and Jayleen worked together, Yasmina had her own and it was decided by them that Brad and Hami would work together. They were to create a full equipment list, and procedures. I informed them that they would be coming to the university to do their investigations but their equipment list would only the only guide of what they would get. Even though there were Grade Nine students in the class and at one point I was the only teacher in the room, my students were extremely focused. Other students were wondering and watching from the back and front however, we chatted about life, goals etc and I was a bit like drill sergeant. In a half hour each of them had a list, procedures and were done. It was also at this point that the Grade Nine girls started to talk to Rhyse and Hami...flirting...oh junior high!

Date: June 7th

Site: Education South Science Lab 359

Time: 12:15-2-30pm

Students that arrived Taylor, Jayleen, Yasmina, Brad, Rhyse. Hami was sick but later found out that he was feeling unwell as he just came back from Winnipeg where he visited his brother's grave. Taylor however did come and was not present the session before May 31st.

So Brad recommended that Taylor was his assistant – which she was. The kids came into the room and I explained that everything they requested was in the boxes. Yasmina asked why they

were all separated and I replied it was the easiest way to make sure that they had room. The reality is that I wanted them to focus without being distracted. Jayleen and Rhyse were at the front bench, Yasmina at a middle table and Brad and Taylor at the back of the room.

They were so excited and being at the university! All students wore their lab coats and soon became annoyed with their goggles (which is a typical student response).

They then began organizing; I informed them that they were not to start Bunsen burners until they checked with me. Yasmina asked what to do and I told her that perhaps organizing everything could be a great start. She went to town with that instruction.

The room was large enough that they could chat but not distract each other; Yasmina was extremely focused on her work. Brad and Taylor required more equipment than initially requested as did Rhyse and Jayleen. I requested that any additions to their list be added in a different colour to the original.

Teacher informed me that she structures her labs similarly kids creating their own list, then doing it but she doesn`t have the same time that we did. Found that to be a strange comment as the kids had never seemed to do something like this before.

I went between the three groups guiding, Yasmina required the least amount of guidance she was fully immersed and organised. The first to start her investigation and finish, she was also the only one that created a conclusion. She had all students taste test as well as myself, Rick Eng (lab tech) and Bill Bagshaw (colleague). She didn`t want the teacher to taste test but I reminded her of our respect rule, everyone is included. Brad and Taylor had miscommunication issues and the lack of a condenser meant their set up took far longer than any other group, so they did not finish and really never had an endpoint for their experiment. Jayleen and Rhyse, Jayleen was definitely in charge which was great as a student she stated that she does not get involved. But it was obvious that she was the leader of the duo. She altered her investigation while there which is quite difficult. They taste tested with fellow students and were the second group to be finished.

During the investigation time period their teacher left for a walk, prior to that she was taking photos of all of the students.

It was interested how when they needed something these normally boisterous and outgoing students did not want to talk to other adults. For example when they needed equipment they had to find it and ask Rick but many were scared to and asked me to instead.

At the end I realised I would not be able to question them about the process so gave them my final focus group questions in print and asked them to write down their thoughts. At this moment Yasmina then asked if I was going to be coming to their school next week and I replied I am not sure, their teacher said sure next Friday. So it all worked out. While filling out the sheets Rhyse asked if he was supposed to use his real or fake name – they remember everything I say – I said

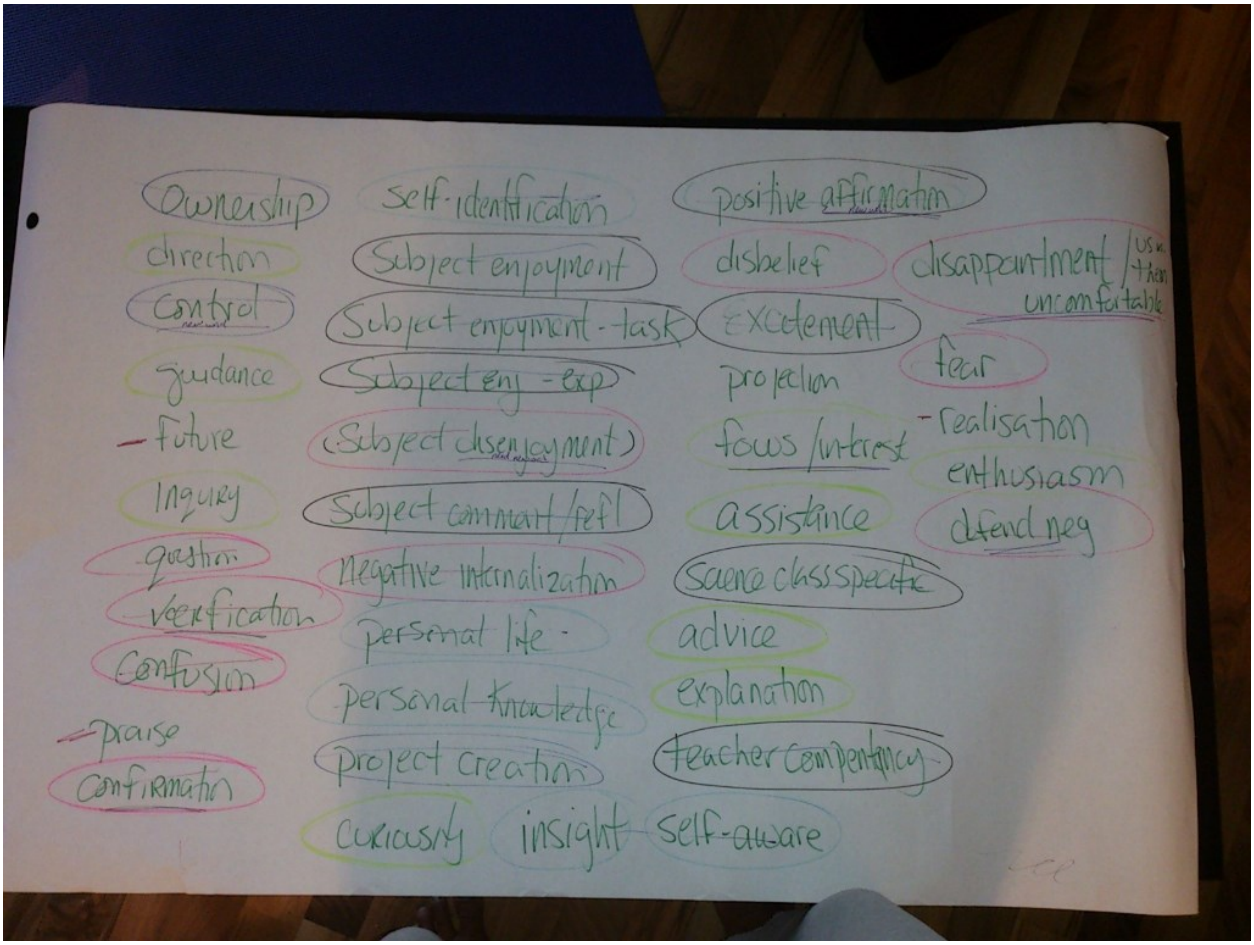
real. We then had a quick discussion of what the real/fake names are about – that it was what I would use when I begin writing. It then hit them, do you have to write all these recordings down..yup...wow.

Greg Thomas stopped by that made me feel great!

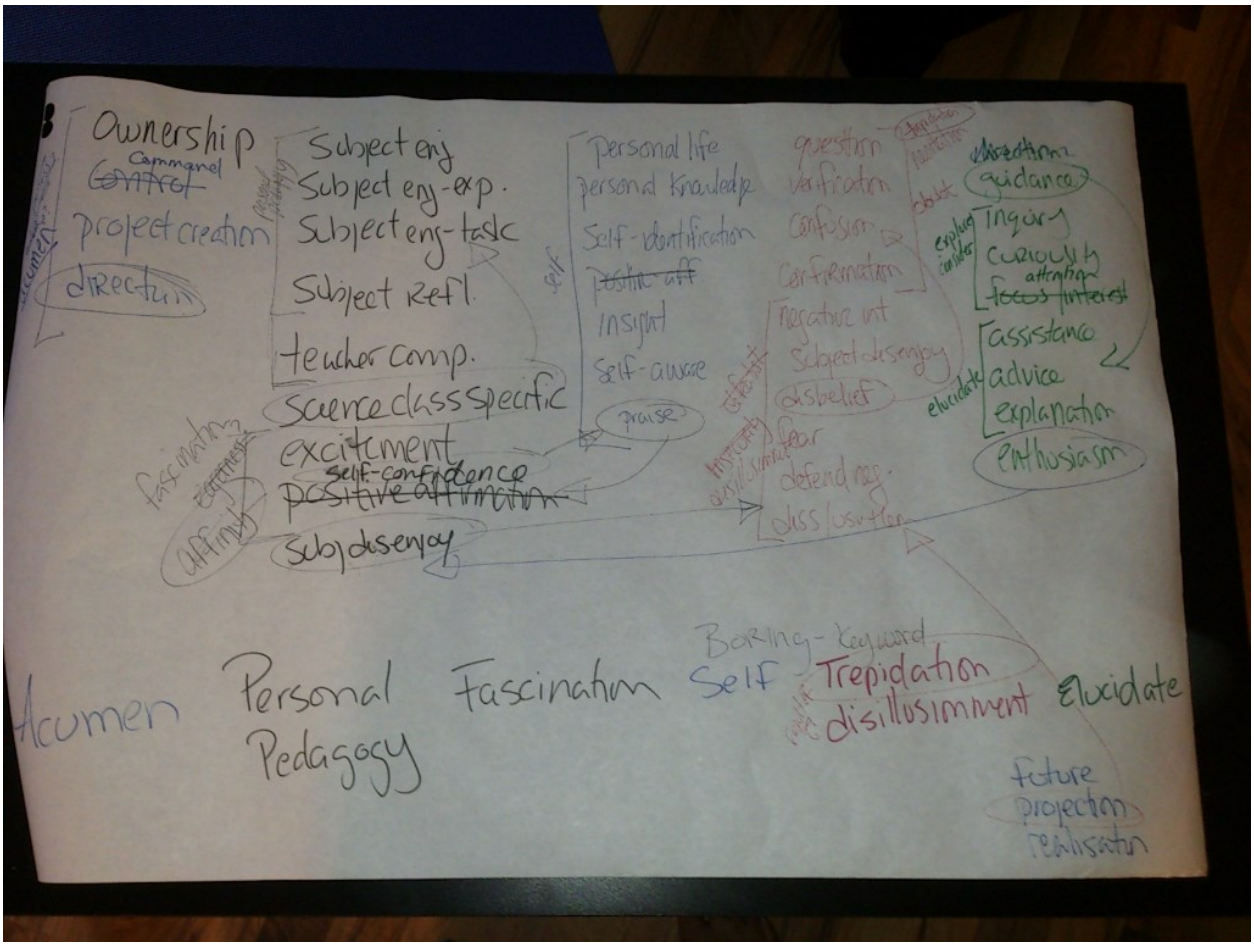
Overall – success, they were fully engaged, fully in touch with what was going on and fully in tune. Last session will be used to discuss their answers to the questions.

Appendix J: Codes

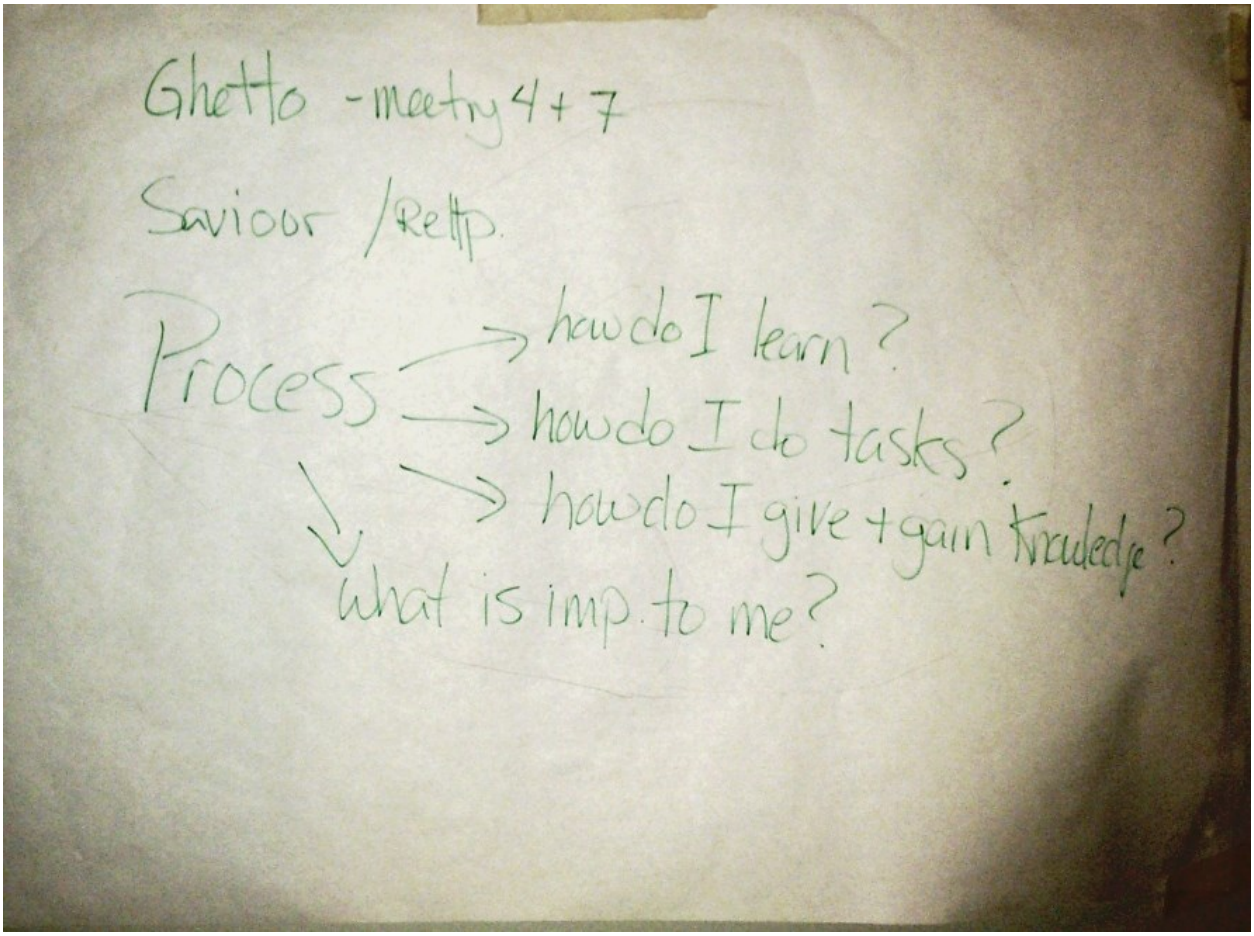
Original 40 codes



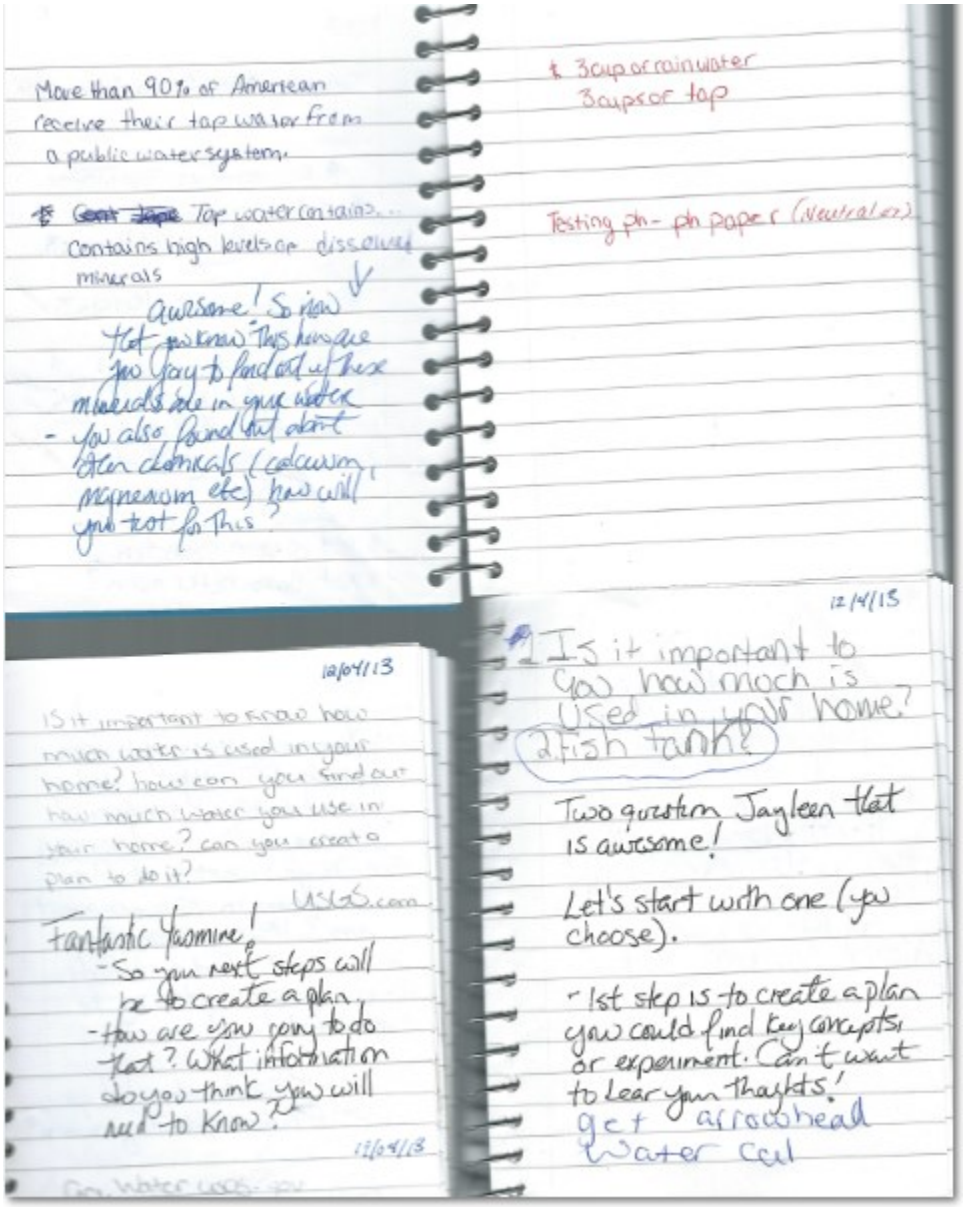
Grouping of Codes Creating Categories

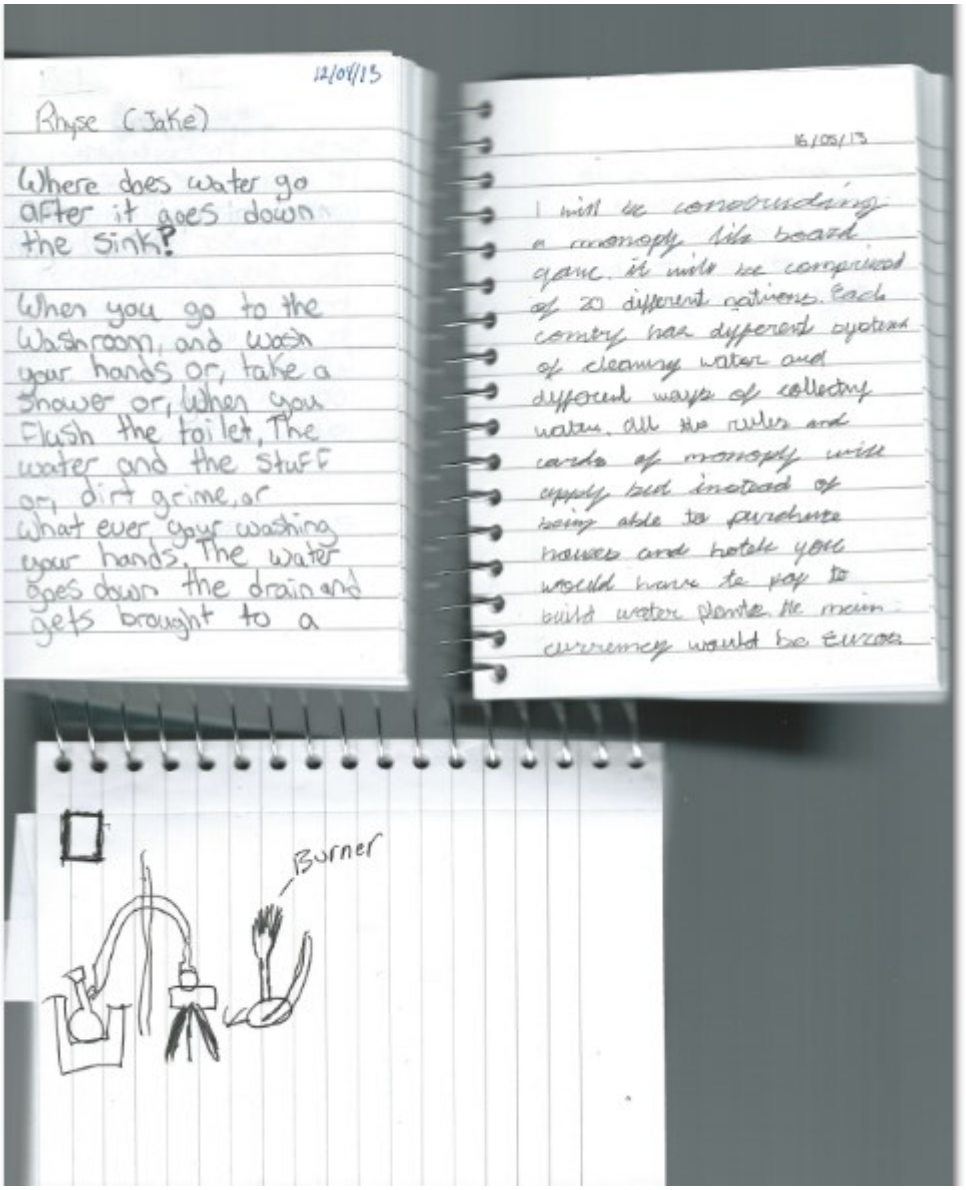


Questions created from interviews

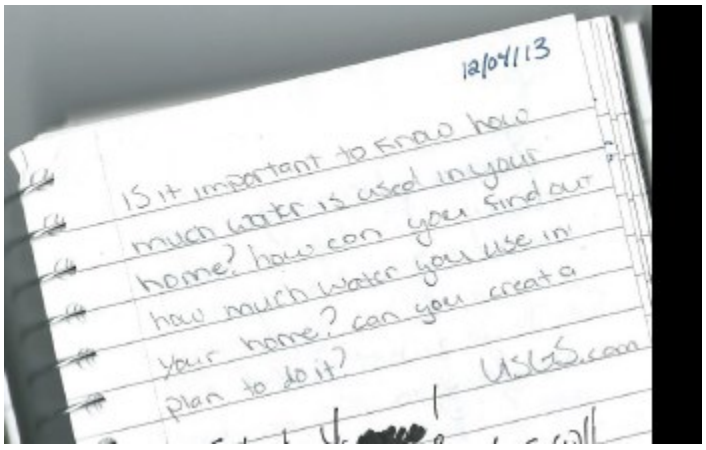


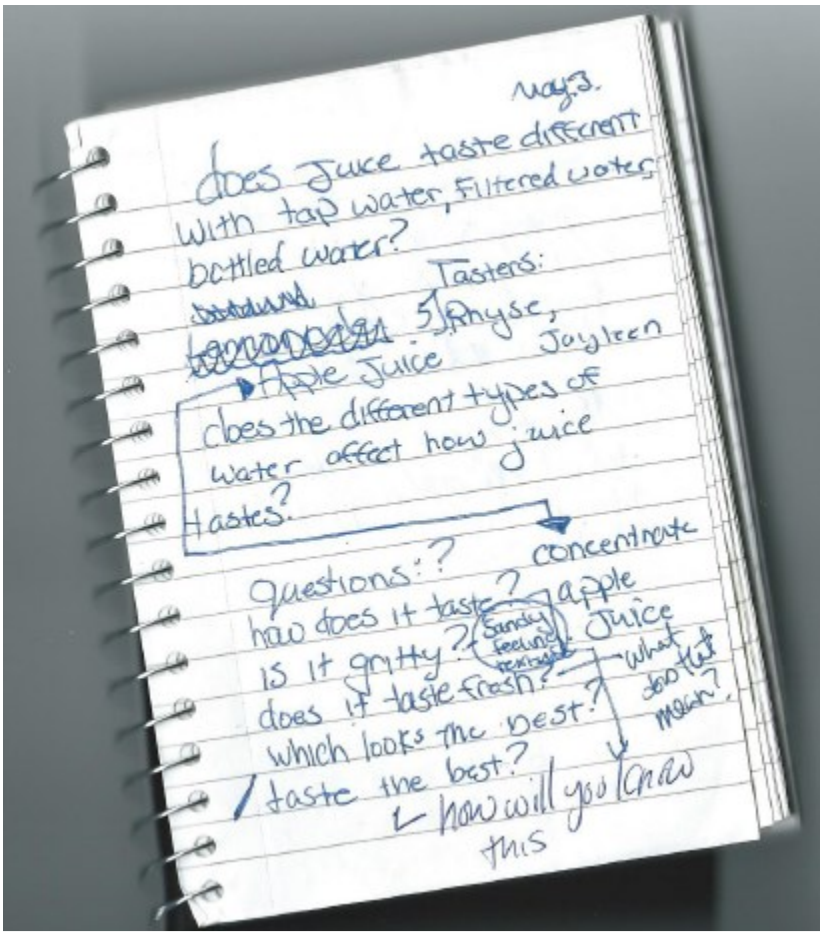
Appendix K: Example of Students Journals




12/04/13
Rhyse (Jake)
Where does water go after it goes down the sink?
When you go to the washroom, and wash your hands or, take a shower or, when you flush the toilet, the water and the stuff or, dirt grime, or what ever your washing your hands, the water goes down the drain and gets brought to a
16/05/13
I will be constructing a monopoly like board game. It will be comprised of 20 different nations. Each country has different systems of cleaning water and different ways of collecting water. All the rules and cards of monopoly will apply but instead of being able to purchase houses and hotels you would have to pay to build water plants. The main currency would be Euros
Burner

Appendix L: Examples of Student Created Questions




May 3.
does Juice taste different
With tap water, Filtered water,
bottled water?
Tasters:
Anyse,
Jayleen
Apple Juice
does the different types of
water affect how juice
tastes?
Questions:?
how does it taste?
concentrate
apple
Juice
is it gritty?
Sandy
feeling
texture
does it taste fresh?
which looks the best?
what
does that
mean?
taste the best?
how will you know
this

Appendix M: Final Questionnaire

1. What do you think we have been doing these past few months?

   H – We've been mapping out and planning out the water unit
   R – Testing water and making are own water
   B – Learning
   J – Learning
   Y - Been learning science

2. Why do you think I am doing this with you?

   H – You wanted to see how we would react because our education was in our hands
   R – To make science more fun
   B – No clue
   J – To learn and teach
   Y - To help us understand science in a better way and see if the way you help us makes a difference to the way we think of science

3. Who is it the same and /or different to what you do in class?

   H – In science class we've been doing booklets pretty much and in here we've been discussing
   R – Totally different because we get to choose what we want
   B – Diffint cuz we outta school
   J – More and fun experiments
   Y - It's different in a good way, I think we understand more when you teach us

4. What do you think about our time together? What have you liked and not liked?

   H – it's been a good time, and we've changed our way of thinking and Monica encouraged us to question everything
   R – It was fun
   B – It was alright
   J – I liked it and the experiments
   Y - I liked that we do experiments to help us learn

5. What did you think about science before we started, how about now?

   H – I've always been in love with science and all things related. My opinion on science hasn't changed
   R – Same feeling
   B – Some thoughts about science
   J – I liked it but we didn't do a lot of experiments

Y - I didn't particularly like science, I didn't think it was interesting, now I like it because it's easier to understand and it's kinda more fun

6. Is science important outside of school?

H – Definitely, it helps us to think about things and definitely question things
R- Very
B – Yes
J – Yes
Y - Science is important outside of school

7. Are you more interested in doing something science related in the future?

H – Yeah, I plan on being a an architect
R – Probably not
B – Yes
J – I don't know
Y - Yes I want to be a marine biologist so I need science, my dream job

8. Where do you think what you did fits in the PoS?

H – My project was based on different countries water footprints.
R – Yes
B – No clue
J – Water unit
Y - Yea a lot