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Observing the Impact of Environmental Science Exploration and Discovery on the Social-Emotional Learning of 2nd Grade Students

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by

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CHAPTER ONE

Introduction

The role of the teacher in the classroom is to understand their students and to recognize what needs are and are not being met, which does not only include academic needs but also what is needed in the area of social-emotional support and learning for all students. Social-emotional learning is the ability to regulate one's own behaviors and to develop character skills (Colverd & Hodgkin, 2011). It has been my experience that in the primary-age classroom these skills and behaviors are often required to be explicitly taught and modeled to ensure that the young learners recognize what is considered a desired behavior.

It is my belief based on my professional experiences that social-emotional learning not only impacts a person's peer relationships but can also have a great impact on their success in the classroom setting. In my experience, I have seen that a greater focus is often placed on literacy and mathematics education, that focus is not shared with the arts and sciences where many learners find success and genuine interest. The sciences provide opportunities for children to participate in hands-on learning activities where they develop 21st century skills (American Forest Foundation, 2019). Additionally, it is my experience that science also lends itself to being taught outside of the four walls of the classroom where children are able to experience the outdoors while learning

> Science is an important part of children's experience in school and should be valued in and of itself. It supports children's curiosity and their need to understand the world around them. Science is a natural focus for their work and play. (Worth & Grothman, 2003, p.159)

My professional understanding is that environmental education is the inclusion of outdoor education, and using our own space(s) to learn about our place in the world. It has been said that environmental and outdoor education have impacts upon classroom behavior (Waite, 2011). It would stand to reason that it is worth asking the question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?*

I believe that this is an important question to ask as these social-emotional skills are essential to a child's success; I also feel that outdoor education and spending time outdoors naturally provides a space for children to play, learn and grow. I have seen that as children enter the classroom in kindergarten, they are asked and tasked to behave in a desired fashion based on school norms. Since not all children participate in preschool and Head Start programs, I have experienced having these skills fall upon the teacher to teach and model in order for children to interact with each other and adults in a positive way. Environmental and outdoor education have been shown to aid in the development of these social-emotional skills: empathy, responsibility, safe and appropriate behaviors, communicating feelings, and developing appropriate relationships with others (American Forest Foundation, 2019). When students do not have these skills academics may suffer, as well as relationships and interactions with others.

Background

My love of environmental learning and the outdoors first began with my earliest school memories. In kindergarten and first grade, I was fortunate to have two teachers who worked together to develop memorable experiences for their students which included school-yard family campouts and conservation education in the classroom. They

both encouraged us to get outside, get dirty and make memories. At this early age, I was able to see first-hand how the outdoor space in the schoolyard could be used in a way that was out of the norm. We were finding worms on the blacktop or frogs in the pond and taking them back to the classroom, keeping them in a stinky bathtub in the back of the room, observing them, and then releasing them back into the schoolyard. The character skills that were learned through these experiences, I believe, helped to shape the person that I am today.

Outdoors

Outside of the classroom, my love for the outdoors grew with time spent with my family. My family moved to a house in the country when I was in 2nd grade. I found excitement in playing outside with my neighbors and trying to rehab critters that my cat injured on his hunting adventures. I could often be found building forts, climbing trees, and tromping through the creek in the back. The town we moved to was a lake town and a lot of time was spent learning how to drive a boat and developing a respect for the water. When I was very young, we spent our summers camping around Minnesota. My dad taught me to fish. I was always in awe of the different animals and bugs that we would see. These experiences undoubtedly not only helped develop my love for the outdoors and the environment but also helped me to develop a respect for nature and develop a sense of adventure. As an adult, I have continued to develop my love of the outdoors. My husband and I enjoy road trips to different national parks. We load up the car and head to the river to canoe and kayak, and since we are both teachers we are fortunate to be able to spend our summers on the water.

My experiences teaching in the outdoors

This love for being outdoors and recreating outside and enjoying the beauty of my surroundings is what led me to find a summer job teaching outdoor recreation for Three Rivers Park District. In this position, I was, for the first time, able to see how my love of the outdoors and experiencing nature and my passion for education could come together and allow for learners to gain important life skills while having fun and finding peace in the outdoors. I taught classes on archery, fishing, kayaking, and canoeing and in addition to learning the physical skills I also had the opportunity to share the importance of keeping our outdoors clean and respecting different animals and natural spaces. When I reflected upon this experience, my love for the outdoors was reaffirmed and the belief that teaching children at a young age about the outdoors can help them grow to become well-rounded individuals that have a respect for the world around us.

Professional Experiences

I graduated high school in 2006 and chose to begin a career in the beauty industry. While working behind the chair, I realized that my calling was the educational side, I was continually being asked to lead and teach classes for other cosmetologists within my salon. I left my salon to begin teaching cosmetology school. This experience of teaching cosmetology students and leading a staff solidified that I should pursue a career in the formal educational setting. While working full-time in the beauty industry, I completed my undergraduate degree coursework through Bemidji State University's online DLite program, which is an online/distance learning program.

Early teaching experiences

Graduating with my degree was by far the proudest moment of my life thus far. I had worked for many years to achieve this goal. After graduation, I was hired immediately to teach kindergarten in a small town about 1.5 hours south of Minneapolis, Minnesota. The setting of this school being in a small town afforded me the opportunity to create unique experiences for my students such as taking walking field trips to local parks and shops and inviting the community into the classroom.

In my second year and last year of teaching at this school, I worked with a team of teachers and community members to fundraise for the school to build an outdoor classroom. I was able to share my passions for the outdoors with others and discuss with stakeholders the importance of including the outdoors in the general education classroom based on my own experiences.

Throughout my years in the classroom, I have been afforded the opportunity to teach kindergarten, first-grade, second-grade, and fifth-grade in two separate school districts that are distinctly different from one another. The first school I taught at was a small-town school with a single elementary building, whereas the district I am teaching in now is much larger with five elementary buildings. Regardless of location, I have always put effort into creating educational experiences for my students that extend outside of our four walls.

Rationale

My current school is in a much larger district and much closer to my home. The school is also situated upon a field of well-mowed grass and perfectly manicured gardens. It does not easily lend itself to outdoor learning due to perfectly manicured lawns and well-maintained landscaping. This space does not have woods, streams, or many native

plants. Typically I have been involved in environmental educational experiences that take place in wooded areas, prairies, or spaces that allow for the learner to explore “natural” and natively grown flora and fauna. I only saw this as a challenge and began right away to develop experiences that I thought are important for young learners to have in the outdoors.

Although the space is not a space that would typically be used as an outdoor learning space, I have felt that it is important to create different learning opportunities for my students in their environment that is most relevant to their lives. I have enjoyed developing these lessons and experiences for my students like taking walks on the path that leads through the neighborhood and finding different bugs and sharing my knowledge about the bugs and their importance. Conversations like this and real-life, in the moment learning has allowed my students to gain understanding of the importance of insects that are seen as pests in their neighborhood like bees and box elders. We have been able to observe the birds that visit our schoolyard and discuss migration. Sometimes it has been as simple as laying on our backs, looking at the different types of clouds and discussing Minnesota weather patterns. It is this type of learning and teaching that has really developed my passion for inquiry-based experiences and giving my students the reins to guide their own exploration, especially in the outdoors.

This research study is an effort to provide experiences in learning that support a child’s natural desire and curiosity to understand their environment, and their role in that environment while focusing on how extending learning outside impacts the whole child. Combining my love for environmental learning and character development led me to

focus my capstone thesis on understanding: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?*

Summary

Growing up in the country supports one's affinity for the outdoors. My summers growing up camping, fishing and boating with my family stands to reason that my love for the environment began immediately. This love for the outdoors and the environment has carried into my own classroom. Now as a teacher, I have worked to create and facilitate educational experiences for my young learners that will not only encourage a love for the environment but also supports their social-emotional learning and growth. The question that I will work to answer throughout this capstone thesis is: *How does environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?*

Upcoming Chapters

In chapter two, I present a history and description of both environmental education as well as social-emotional learning. I will also look at definitions of both, how they are incorporated into the classroom, how they can be merged together, challenges teachers face during implementation, and finally I will be sharing the effects of environmental education on social-emotional learning in primary age children.

Chapter three provides the rationale of the study as well as information on the participants and the research site. This portion of the capstone thesis is intended to provide an in-depth overview of the study and data collection tools.

CHAPTER TWO

Literature Review

Introduction

The purpose of this study is to gain deeper knowledge and understanding of the connectedness of environmental education and social-emotional learning. This is the basis of the research question: *How does environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?* This question is an important one to ask as it pertains not only to the attitudes and beliefs of environmental education in our youngest pupils, but also looks at how integrating and including environmental education into the general education setting impacts a child's personal development.

Before delving into the guiding question, *How does environmental science exploration and discovery support the social-emotional learning of 2nd grade learners,* it is important to define what the definition of primary-age students in this literature review and thesis is being used. The National Center for Education Statistics (or NCES) (n.d.) developed the International Standard Classification of Education (ISCED) (2011) which uses the terms elementary education and primary education interchangeably and states that ages 6-11 or grades 1-6 are considered elementary age or primary age students (p. 30). However, for the sake of this paper, I use a more narrow-focused definition of primary-age students, kindergarten - third grade (Merriam-Webster dictionary, n.d.). The intention is to focus this study on young learners rather than using the broadened definition and the interchangeability of elementary education and primary education as

the ISCED uses. Thus, moving forward in this review, the term primary education will be used to describe children in grades kindergarten through third grade.

Chapter Overview

The first section of the literature review focuses on environmental education (EE). Time will be dedicated to both the history of environmental education and environmental education in the modern formal classroom setting. Understanding the transformations of environmental education over time will help to ground environmental education as a foundational and important aspect of the elementary education classroom rather than as an educational fad. The chapter continues by defining and discussing social-emotional learning (SEL), and how social-emotional learning can be supported in the formal educational setting through outdoor and environmental education while maintaining focus on the guiding question: *How does environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?*

History of Environmental Education

To pinpoint the precise beginning of environmental education is quite difficult, as humans we have always been connected to our environment. Environmental education was mentioned in text as early as Rousseau in 1762 (as cited in McCrea, 2006) Rousseau (as cited in McCrea, 2006) went on to share ideas on the importance of educators to focus educational experiences on the environment (p. 2). Agassi (as cited in McCrea, 2006) supported this sentiment through the 1800's and stated, "children should study nature, not books" (p. 2). In the 1900's the terminology for environmental education changed and the ideals transformed to a more ecological and conservation education approach.

Distinguished botanist, Liberty Hyde Bailey, refused to use the term "environmental education", as it was thought that it was, "imprecise, theoretical, pompous, and would always need to be explained" (as cited in McCrea, 2006, p. 2). He instead supported the term "nature study" which was widely used until the 1920s when ecology became a more established scientific field. In the 1930s, the *Dust Bowl* era gave-way to the conservation education movement (McCrea, 2006). During this time, the emphasis was put upon conservation education, and environmental education became a way for people to get fresh air and sunshine and live a healthy lifestyle (Luginbuhl, 2019).

Throughout the next decade and World War II, encouragement for outdoor recreation and environmental education continued. It was believed that this would support emotional well-being and stability while alleviating the pressures of the war (Luginbuhl, 2019). This new way of learning about and for the environment was led by educational pioneer Dewey (as cited in McCrea, 2006).

Throughout the 1900s, Dewey established himself as an educational pioneer when he established his thoughts and beliefs of a student-centered educational approach that focused on learning by doing and encouraged lifelong learning (McCrea, 2006). Dewey wrote *"The School and Society"* in 1915. This approach to childrens' education is at the heart of what environmental education is: experiential. This text featured Dewey's (1915) thoughts on an ideal school space and education for children:

> No number of object lessons… can afford even the shadow of a substitute for acquaintances with the plants and animals of the farm and garden acquired through actually living among them and caring for them. (p. 8)

Dewey saw schools as a place where education should take place among the natural environment, and that teachers should be facilitators of hand-on learning experiences (Dewey, 1915). Dewey saw the mind as something that continuously grows and changes as a function of a person's social life, but is not able to simply develop on its own (Dewey, 1915). This is the approach to education that Dewey is infamous for, learning by doing (as cited in McCrea, 2006).

Conclusion

In conclusion, theorists have been promoting the importance of environmental education for children for nearly 250 years (as cited in McCrea, 2006). Although environmental education has not been a part of formal education for long, Rosseau, Agassiz, and Dewey each have made an impact on the education of the children of today. Louv (2005), a more modern environmental education author, discussed the importance of children spending time outside and the impact that environmental and outdoor education has on a child's mental, physical, and intellectual well-being. One can see that although the theorists had differing views of how to do science, all theorists mentioned were in favor of allowing children time to explore their outdoor and natural surroundings.

Modern Environmental Education

Environmental education is an important part of elementary education because it supports the emotional, intellectual, and physical development of students (Humberstone & Stan, 2009). Environmental education has been a part of formal education for nearly 250 years as can be seen in the writings of Dewey, Rousseau, and Agassiz (as cited in McCrea, 2006).

Prior to discussing modern environmental education in the 21st century, it is important to understand what the term *modern* means in this context. The term *modern* for the sake of this paper means 1968 and after. The reasoning behind this is because after the development of the Council for Environmental Education or CEE in 1968, the decade leading up to the development of the Council for Environmental Education was teaming with environmental concern that was in large part led by the Counterculture of the 1960s (The Modern Environmental Movement, n.d.).

Leading up to the establishment of the CEE, more attention was being placed upon environmental concerns. The 1960s, for instance, began with *Silent Spring*, by Rachel Carson which is, "acclaimed as the catalyst of the modern environmental movement" (as cited in The Modern Environmental Movement, n.d., para. 14). Shortly after this book was published bills were passed for the Clear Air Act in 1693 (para. 18), Water Quality Act in 1965 (para. 19), and Endangered Species Act in 1966 (para. 20). These events show that throughout the decade(s) leading up to the establishment of the Council for Environmental Education more interest and importance was being put upon the growing concerns of the environment. This concern brought attention to different optics that impacted the earth's environment and human population. Soon after the development and establishment of the Council for Environmental Education the first Earth Day took place in 1970. The first Earth Day was created and celebrated in protest to environmental ignorance and was the largest demonstration in American history (The Modern Environmental Movement, n.d.).

After the Council of Environmental Education was established and there was an abundance of growth in the area of environmental education including the definition that

is used today which was established in 1970 by Palmer (1998) through the organization, International Working Meeting on Environmental Education in the School Curriculum:

> Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality. (p. 12)

The decade of the 1970's was robust with growth in the area of environmental education; this decade began with the celebration of the first Earth Day in 1970 (McCrea, 2006). Throughout the remainder of these 10 years, the focus continued to be placed on environmental education, and in 1977, the Intercontinental Conference on Environmental Education in Tbilisi, Republic of Georgia took place (McCrea, 2006). According to the NAEE, the intention of this conference was to not only discuss the problems plaguing the global environment, but also what role education can and should play in combating these problems (North American Association of Environmental Education, n.d). As noted in the final report of the Intergovernmental Conference on Environmental Education, transcribed by UNESCO (2011), it was decided that environmental education is a substantial contributor to resolving many environmental problems the globe is facing and should be integrated into formal education for all students throughout every grade and age level.

Implementation of Environmental Education In the Classroom

Project Learning Tree (American Forest Foundation, 2019) stated that environmental education implementation in the formal and informal educational setting provides students opportunities to engage in real world issues (American Forest Foundation, 2019). This idea of exploration and discovery of environmental education in the classroom aligns with Dewey's idea of learning by doing, and encourages skills needed for the 21st-century learner, such as problem solving and critical thinking (American Forest Foundation, 2019; Yesilurt et al., 2020). In the formal education setting, Project Learning Tree outlined the benefits that teachers reported such as the support of academic achievement through experiential learning, improved student health and well-being, the cultivation of leadership qualities, and improved focus and cognition (American Forest Foundation, 2021).

According to Humberstone and Stan (2011), learning outdoors may be beneficial to those who struggle to focus and encourages independence in learning (para. 4). Project Learning Tree also discussed how environmental education breaks the indoor habit, and supports student health by encouraging outdoor play, and supporting a connection with the natural world (American Forest Foundation, 2021). With pressure being placed on academics in the elementary classroom, the unpredictability of the natural world can be utilized to rekindle excitement

In the book, *The Last Child in the Woods*, Louv (2005) shared his beliefs around nature deficit disorder. Louv described nature deficit disorder not as a medical diagnosis, but rather as an observational change in behavior of children from previous generations (Louv, 2005). Rather than playing in and enjoying the beauty and splendor of nature, the

children of today are spending more and more time inside watching TV and using computers and other forms of technology as entertainment. To be more precise, Louv shared that the term nature-deficit disorder is intended to express the effects detaching oneself from nature; those effects. According to Louv (2005), this may include, "...diminished use of the senses, attention difficulties, and higher rates of physical and emotional illness" (p. 36). This idea of increased usage of technology and less time spent outside as having a negative impact on children is concerning not only to the academic successes of students in the formal classroom, but also their mental well-being.

In order to implement nature education in the formal education setting, teachers need to not only provide time and space, but also need to scaffold expectations and tailor the activities to the needs of the children present (American Forest Foundation, 2019). In *Worms, Shadows, and Whirlpools,* Karen Worth and Sharon Grollman (2003) shared, "high quality science programs for children… are based on an understanding of how children learn, what they are capable of learning, and appropriate science content" (p. 3).

Outdoor Education. Outdoor education is the combining of everyday school activities that would traditionally take place within the confines of the classroom and moving them to the outdoors (Cotic et al., 2020). Outdoor education provides the opportunity for authentic learning and experiential learning to take place. Authentic learning is meaningful to the learner and relates to the real world while providing a hands-on and kinesthetic approach to education and learning (Cotic et al., 2020).

While outdoor play and time spent outdoors during the school day is declining, elementary schools are taking notice by seeking alternative and informal educational experiences to encourage meaningful and experiential learning (Waite, 2011). In some

Scandinavian countries, the benefits of outdoor learning are being recognized for their benefits to the physical, emotional, and intellectual development of learners (Humberston & Stan, 2009). Some of the outcomes observed by teachers of increased time spent outdoors have been an increase in confidence, self-esteem, independence, and better social interactions among others (Waite, 2011). The students subsequently reported feeling refreshed and positive after their outdoor learning (Waite, 2011).

Environmental Education Programs

Around the world, the importance of time spent in nature is being recognized in the formal education setting (Humberstone & Stan, 2009). A variety of programs have been developed to integrate the outdoors into the formal and informal education settings, some of the efforts are solely focused upon the design and redesign of school grounds to support outdoor learning (Rivkin, 1998). These programs were created to integrate and support outdoor learning happening around the world (Rivkin, 1998).

In the United States, some of these programs include Project WILD, which according to Project WILD, aims to create and form "responsible actions toward wildlife and related natural resources" (Association of Fish and Wildlife, 2019, para. 1). In the United Kingdom, Forest Schools (as cited in Cotic et al., 2020) have been developed.; this program is a combination of classroom time and time spent outdoors (p. 24). These programs are not only focused upon the child's relationship with nature, but also focus on the whole child and the need for multiple modes of learning and experiences for learners to find success in an informal educational setting (Cotic et al., 2020; Association of Fish and Wildlife, 2019). As educators and schools provide the setting for children to learn, the learning must be rooted within the science standards. These Next Generation Science

Standards have been written to ensure that the needs of 21st-century learners are being met (National Science Teachers Association, 2014).

Conclusion

In conclusion, environmental education programming provides the space for learners to not only explore the world around them but to learn from their surroundings. The formal classroom may find it difficult to truly implement environmental education due to curriculum requirements, however, outdoor education practices may supplement the desire and need to spend time outdoors as children will still reap the benefits of time spent outside while learning. The benefits of outdoor education and environmental education not only support the development of environmental awareness, but also may diminish symptoms of attention difficulties in the classroom and support academic growth. The sciences are a natural fit for environmental learning and outdoor experiences in the general education classroom.

Science Education

Across the globe different programs, groups and initiatives have been developed to encourage and support the implementation of environmental learning and outdoor experiences in the general education classroom. A few of those programs include Project Learning Tree (American Forest Foundation, 2019) which encourages learning about and within our local forests, Project WET (2016) which focuses on water education, Project WILD (Association of Fish and Wildlife, 2019) which focuses on wildlife habitats, and the Beetles Project that defines itself as “a collection of passionate science and environmental educators devoted to improving the quality of outdoor science education” (The Regent of the University of North Carolina, 2019, para. 1). In fact, Beetles is an

acronym that stands for “Better Environmental Education, Teaching, Learning, Expertise, and Sharing” (2021, para. 1).

Science education is critical to the education of all children (Luginbuhl, 2019). The Beetles Project, which supported this idea by stating, “science- and therefore science education is central to the lives of all Americans” (The Regent of the University of California, 2021). One can venture to assume that this statement can extend to all people regardless of nationality.

Over the last 20-30 years there have been major changes and scientific growth around the world, this was the basis for the development of the Next Generation Science Standards, or NGSS (National Science Teachers Association, 2014). The NGSS standards were developed to align with the needs of 21st-century learners (The Regent of the University of California, 2021). These standards were written in three-dimensions: practices, content, and crosscutting with the overarching goal of learners gaining a deeper understanding of the sciences and the impact of human behavior on the world around us (The Regent of the University of California, 2021). The Next Generation Science Standards (National Science Teachers Association, 2014) are intended to be performance-based and encourage a more investigative approach to science education, “scientific inquiry involves the formulation of a question that can be answered through investigation” (National Science Teachers Association, 2014, “three dimensional learning”, para. 3).

With more rigor focused on reading and mathematics, time for the sciences in many classrooms has declined (National Science Teachers Association, 2014). To remedy this decline in science time the NGSS standards have been designed to be integrated into

other subjects to ensure that science standards are being met across all grade levels (Luginbuhl, 2019). Teachers are encouraged through the NGSS standards to use language found in the language arts curriculum such as who, what, when, where, and why to ask questions that drive inquiry in science. Teachers are also encouraged to share texts that match the science standards to develop a unit that cuts across different subjects like language arts, writing, and mathematics.

Conclusion

Science education provides the most obvious space for environmental learning to take place within the confines of the formal school day. With much emphasis having been put on mathematics and literacy, the NGSS standards have been created to be integrated into these core subject areas.

Social-Emotional Learning

Social-emotional learning, or SEL, is described by author Clark as, “the process of developing and using social and emotional skills” (Clark, n.d., para. 2). Price (2019) went on to extend this definition by saying that social-emotional learning is:

> A process for helping children ...develop the fundamental skills for life effectiveness. SEL teaches the skills we all need to handle ourselves, our relationships and our work effectively and ethically. These skills include recognising and managing our emotions, developing care and concern for others, establishing positive relationships, making responsible decisions, and handling challenging situations constructively and ethically. They are the skills that allow children to calm themselves when angry, make friends, resolve conflicts respectfully, and make ethical and safe choices. (p. 316)

These skills can be summarized to include self awareness, self management, social awareness, relationship skills, and responsible decision-making (Clark, n.d.; Price, 2019). A focal point of social-emotional learning is for a person to develop empathy, and it is important to note that a person is not necessarily born with empathy and must be taught through interactions, explicit teaching, and modeled behaviors (Colverd & Hodgkin, 2011). Children may develop these skills at different times. This paper focuses on the skills that are developed during the ages commonly associated with primary-age learners, ages 5-8.

Social-Emotional Learning in the Classroom

"If society is to flourish and the world in which we live is to be safer and more benevolent, then it must be populated by individuals with healthy character" (Berkowitz, n.d., p. 69). School is a constant safe space for children, and is a space where children can see positive behaviors modeled through the adults (Colverd & Hodgkin, 2011). Schools can provide the space for children to learn these pro-social-emotional behaviors. Although there are programs, practices and curriculums that have been developed for the classroom such as responsive classroom techniques, teachers and schools can provide a social-emotionally literate environment through everyday interactions with their students (Colverd & Hodgkin, 2011).

To support the social-emotional learning of all students, the climate and community within the school should have a belief system that regards expectations, potential and achievement, along with the firm belief that all children deserve the chance to change their behavior (Colverd & Hodgkin, 2011). This sort of safe space and

restorative practice allows a child to not only see the desired behaviors but also have the opportunity to change their undesired behaviors (Clark, n.d.).

For a teacher to develop a community within their classroom for children to grow emotionally and intellectually, it is crucial that the teacher knows their students as individuals (Berkowitz, 2011). This development of community and family begins on Day 1 (Lickona, 1988). When a child sees that they are understood by the adults in their lives they are able to feel connected to their classroom (Berkowitz, 2011). The classroom routines and processes can have lasting effects upon the development of a child's self esteem, or how they value themselves (Berkowitz, 2011; Colverd & Hodgkin 2011; Lickona, 1998). This classroom community and structure of the classroom is the development of a democratic classroom where students and teachers feel respected (Colverd & Hodgkin, 2011). By having a mutually respectful environment these children will know and understand how to work through their emotions in a space where they feel supported and safe (Colverd & Hodgkin, 2011; Lickona,1988).

Social-Emotional Learning for Primary Classrooms

Teachers in the primary classroom setting have the unique challenge of educating young learners who are growing and developing at a rapid pace (Clark, n.d.). These children are typically between the ages of 5-8. During this period of their lives, children are beginning to enjoy playing and conversing with other children. They are typically eager to please but are also testing their boundaries (Morin, n.d.). Clark (n.d.) also went on to discuss how children during this period of their lives may begin to have feelings of embarrassment, develop perceptions of others, and as they deal with frustration or anger they may resort to angry behaviors. These developments and behaviors are shown in

different ways within the confines of the classroom. When the classroom is brought outdoors these behaviors may appear as risk taking behaviors or risky play (Clark, n.d.).

Risk-Taking Behavior. Primary-age children are typically at the point in their social-emotional development of testing their boundaries both personally and interpersonally (Clark, n.d.). Testing one's boundaries outdoors may result in risk taking behaviors. According to Holecko (2020), risk taking behaviors are considered to be:

1. Play at heights
2. Play at high speeds
3. Play with dangerous tools
4. Play near dangerous elements (like water or fire)
5. Rough-and-tumble play (like wrestling)
6. Wandering alone away from adult supervision (para.4)

As one can see, these behaviors lend themselves to outdoor learning and play (Maynard & Waters, 2007). By pushing their own boundaries and trying risky activities children are strengthening their vestibular system which supports emotional regulation and paying attention at school (Holecko, 2009). Although some children and teachers may prefer the safety and security of being indoors, outdoor spaces can provide a glimpse into the whole child and awaken senses which provides a more elicit vocabulary in children (Humberstone & Stan, 2011). Maynard and Waters went on to discuss that movement and play is of the most natural modes of learning and that risk taking behavior in children may lead to their dispositions and learning paths as they grow.

As discussed by Price (2019), social-emotional learning is the opportunity for children to learn how to handle themselves and their emotions to develop healthy

relationships. These skills allow children to calm themselves when angry, make friends, resolve conflicts respectfully, and make ethical and safe choices (Price, 2019). The adults involved in the lives of children, specifically teachers, have a unique opportunity to not only explicitly teach these skills, but also to provide a classroom space and environment that supports their social-emotional learning and growth.

Conclusion

Social-emotional learning and development is pivotal to the education and growth of children. While focusing on primary-age children the encouragement or support of risk-taking behavior is imperative to the development of self. An important aspect or characteristic of an emotionally intelligent child is being able to recognize their emotions and changing their behavior (Colverd & Hodgkin, 2011). Emotions are a person's reaction to something that happened, children need adults around them to help them recognize emotions and provide the language to discuss and overcome emotions (Colverd & Hodgkin, 2011). In the early elementary years, children begin to have feelings of embarrassment and are able to consider alternatives and consequences for their behaviors (Lickona, 1988). By providing the space and guidance children are able to develop these skills.

Social-Emotional Learning and Environmental Education

Environmental education and social-emotional learning have many overlapping goals when discussing primary-age learners. Environmental education within the formal education setting encourages a break from the school routine (Coates & Pimlott-Wilson, 2019) and social-emotional learning supports that not all children will learn and develop

the same way and that some children will need additional time and space to explore the skills associated with social-emotional learning (Clark, n.d.).

Although previous generations have spent time learning outdoors, most modern formal education is taking place within the 4-walls of the classroom and time spent outdoors is declining (Coates & Pimlott-Wilson, 2019; Waite, 2011). As children are spending more time indoors, the amount of children who struggle with attention difficulties, sensory diminishment, physical and emotional ailments, and depression has increased (Louv, 2005). Time spent outdoors and playing outdoors both support mental and physical well-being and may provide a safe-guard against poor social and physical ailments (Coates & Pimlott-Wilson, 2019).

Within the formal school setting, most outside time is spent on the playground or within the perfectly manicured school grounds. Unfortunately, many modern "playgrounds" do not necessarily promote outdoor or environmental learning or risky play (Holecko, 2020). Time spent outdoors in the formal school setting is oftentimes done under constant supervision, thus children are often discouraged from exploring risky play behaviors (Maynard & Waters, 2007). This teaches and supports ideas like 'stranger danger', and sees the child as helpless rather than resourceful (Maynard & Waters, 2007). However, when children engage in risky play they are able to develop their own sense of safety and a feeling of empowerment which supports the development of self-esteem (American Forest Foundation, 2021).

Conclusion

Based upon the reviewed literature, it can be concluded that time spent outdoors not only supports environmental education but also social-emotional learning. By

providing a space outdoors where children can grow and develop they are able to not only make connections to the world around them, but also explore their environment in a way that promotes growth and social development and allows them to learn and understand their boundaries.

Chapter Summary

Environmental education and social-emotional learning are imperative parts of the educational experiences for children of all ages. This literature review was done with the intention of gaining a deeper knowledge of the guiding question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?*

For nearly 250 years educational theorists have spoken upon the benefits of environmental education in the education of all learners. Although there are many benefits to the implementation of environmental education on the social-emotional learning of primary-age students, many schools do not have a curriculum to support this way of teaching and learning. Thus, the integration of EE within the core subject areas like math and literacy is touched upon throughout the literature review.

The next chapter further explores how to answer the question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?* Through this exploration, I look at the correlation between environmental education and social-emotional learning for my primary age learners through an integrated implementation of environmental education and outdoor learning and teacher observations of student behavior and disposition.

CHAPTER THREE

Research Methods

Overview

The literature review in chapter two supports that environmental education and outdoor learning may have an impact on social-emotional learning for 2nd-grade student learners. The literature review was conducted in an effort to answer the question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?* This question is important because 2nd-grader learners, or primary-age students, are developing quickly and at different rates (Clark, n.d.). Time spent outdoors and learning about the environment not only can impact their environmental stewardship as they grow, but can also impact how they interact with each other and how they see themselves (Lickona,1988; Maynard & Waters, 2007).

Research Rationale

Environmental education within the formal education setting encourages a break from the school routine (Coates & Pimlott-Wilson, 2019). Social-emotional learning supports that not all children will learn and develop the same way and that some children will need additional time and space to explore the skills associated with social-emotional learning (Clark, n.d.). Due to the setting of the research, it is also important to note that some if not many of the activities may fall under the umbrella of outdoor education. Outdoor education is the combining of everyday school activities that would traditionally take place within the confines of the classroom and moving them into the outdoors (Cotic et al., 2020).

Research Design and Intention

I increased the time spent outdoors exploring the natural setting of the school grounds in suburban Minnesota during the winter months to explore the question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?* This exploration focuses upon snow and winter weather. The students were encouraged to work together to develop questions together as a whole-group, small-group and individually that drive their inquiry about snow and winter. I facilitated the exploration through scaffolded activities, texts, and resources to prepare the students with background knowledge.

The student learners had opportunities to explore snow through inquiry-driven and exploratory experiments outdoors and within the confines of the classroom. The students worked together in teams to design, conduct and write about their experiences and what they have learned. This type of exploration was intended to be exploratory for the student participants and allow me to facilitate, but more importantly to make observations of participants in their natural setting and to make connections to their social-emotional learning and focusing on the guiding question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?*

Research Structure

This research was designed to allow the participants to spend an increased amount of time outdoors and exploring their surroundings. Since this setting is in Minnesota where there is yearly snowfall and the timeline allows for a winter data collection, the students participated in winter environmental science exploration and discovery. This

means that the participants had time outdoors each day to investigate and explore snow and different aspects of winter. The participants each had some schema of winter as all participants have spent at least 1 winter in Minnesota, however, each participant's comfort and excitement were different.

This research was designed to work around and with the predetermined daily schedule that has been implemented by the administration. The students receive 30 minutes of language arts core instruction, 45 minutes of targeted or small group language arts instruction, 30 minutes of writing, 25 minutes of theme or science/social studies, and 90 minutes of math daily. The administration requires these times. Based upon my research plan, I integrated the general theme of winter, snow and science into the language arts, writing, and math times throughout the day. This allowed my participants to have 25 minutes daily to focus upon their science skills without time being taken away to meet the rigorous timing requirements for the other core subjects.

The research has been designed to fit the qualitative research model. The research tools have been designed to allow me to make field observations, and reflections along with weekly surveys. In the article, *What's the difference between qualitative and quantitative research,* Dr. Saul Mcleod defines qualitative research as, "the process of collecting, analyzing, and interpreting non-numerical data… Qualitative research can also be used to understand how an individual subjectively perceives and gives meaning to their reality" (Mcleod, 2019). This has been the chosen research method because of the intention behind making observations, reflections and using survey data to gain an understanding into how an increase of time spent in science exploration and discovery primarily outdoors may or may impact a participant's social-emotional learning which is

a component of their reality.

Procedure

Based upon the needs of the setting and the design of the research, the participants participated in a snow and winter unit that is woven into other subjects for approximately 15 school days, or three weeks. The students were exposed to fiction and nonfiction texts related to the unit in language arts where I asked questions to guide inquiry for the science exploration. The students also used their writing time to write about their findings and worked on science lab writing to meet the standards in both subjects, and in math the unit continued to allow the students to explore measurement while maintaining focus on snow and winter.

The structure of the unit was based on the Gradual Release of Responsibility Model. “The gradual release of responsibility model suggests that cognitive work should shift slowly and intentionally from teacher modeling, to joint responsibility between teachers and students, to independent practice and application by the learner” (Frey & Fischer, 2013). This model can be thought of as an I do, We do, You do model. Based on this structure and idea, the unit was developed into three weeks to follow the gradual release of responsibility model.

Science Exploration Weekly Plan and Outline

The participants having developed background knowledge from the different text exposures in language arts were able to work as a whole-group, small-group and individually to develop an understanding of their winter and snow explorations.

Week One

The participants were given a survey to provide background knowledge, comfort,

and personal feelings about snow. This survey provided information about individual participants and provided baseline information for research. Additionally, this gave me the opportunity to reach out to families regarding winter gear and ensure that all participants had the necessary garments for this unit to allow all participants to participate safely in the cold months.

During the first week, the participants had multiple opportunities to explore outdoors. This provided a chance for me to develop and discuss guidelines and expectations about safety, timing, and boundaries. This time also provided an opportunity for the participants to gain a sense of safety and place within the setting. I took this first week to notice who was following the expectations, coming prepared, working with and near other participants, and who needed redirection throughout the week.

During the first week the participants observed me walking through each step of the Scientific Method (see Table 1).

Table 1

Scientific Method

1. Make observations
2. Ask a Question
3. Develop a Hypothesis
4. Test the Hypothesis
5. Share the Result(s)

(Covoji Learning, n.d.)

While stepping through the scientific method, I focused on snow and inquiry. This portion of the unit was meant to be an, *I do,* experience for the participants. The students'

job was to participate and observe how I completed the steps effectively and explicitly.

Week Two

The students were given another survey during the second week. This survey allowed me to gauge the feelings of the participants while checking for understanding of the purpose of the unit, and new learning mid-way through the research cycle. This survey allowed for the students to share insight, and possible concerns moving forward. This information was used to make any needed adjustments to the learning space, and for Design Teams in week three.

The second week of the unit allowed for the participants to work together as a class through the scientific method. This week was meant to be a, *we do*, experience to match the gradual release of responsibility model. This provided the participants the opportunity to gain some independence while being supported in the process. The purpose of moving gradually through the process was to provide students the opportunity to participate and share ideas while having guidance from the teacher.

Throughout the second week, the students worked together as a whole-group and independently to complete their Snow Observation and Exploration Packet. This packet walked the class through each step of the scientific method. Some items were done as a whole class, and some were done independently. To allow for differentiation, the packet included spaces where participants can draw rather than write.

Week Three

The third week began with the teams working together to ask questions and discuss winter and snow exploration. The students were split into teams of five, or five groups of five. Throughout the week the student groups worked together to complete

their research packet. This week was designed as a, *you do*, experience to follow the gradual release model. This packet guided them through the scientific method. Each participant was given a role for their team (see Table 2).

Table 2

Design Team Roles

Role Title	**Role Duties**
Leader	● Shares the task ● Makes sure everyone has a chance to share
Speaker	● Asks the teacher questions ● Shares groups ideas with class
Recorder	● Takes pictures of the group ● Posts pictures to SeeSaw
Supplier	● Collects and returns supplies
Time Keeper	● Sets timer for tasks ● Gives updates on timing

Throughout the third week, the students worked within their groups to step through the scientific method while observing, discovering, asking questions, and experimenting with snow. The student groups worked together to complete their Winter and Snow Discovery and Exploration DESIGN TEAM packet. This packet walked them through the process. Throughout the third week, the facilitator continued to guide and support where needed and provided a safe space for the students to complete their tasks, however, by this time in the process I was able to do more facilitating and coaching rather than explicit instruction.

Facilitation -

The research method for this qualitative research study on the effects of environmental education on the social-emotional learning of primary-age students was primarily a form of observational research notes. These notes will be conducted in real-time where I noted observations of student activity and interactions. The reflection took place after the activity and I made notations regarding my own reflections as well as behaviors that were seen after the activity and time spent outdoors. This type of data collection allowed me to identify behaviors in real-time as well as reflect on behavior throughout the day(s); this is an important aspect of this type of research because it was hard to know which students will participate on any given day or how the students would react and behave and allowed for flexibility from day-to-day. Since observational research was a personal endeavor, field notes provided the most appropriate form of data collection.

The data collection was in real-time through observations and reflections. As that data is collected I was able to analyze it and identify coded behaviors relevant to the research.

Research Tools

As this research was being conducted and specific SEL behaviors were observed or not observed it is crucial that those behaviors and signaled behaviors were coded and included in the data collection and analysis. The behaviors that fall under the umbrella of social-emotional learning include:

1. Self awareness
2. Self management

3. Social awareness
4. Relationship skills
5. Responsible decision making (Clark, n.d.)

With these social-emotional behaviors in mind, it was my intention to identify behaviors that may be seen in the participants throughout not only this activity but also throughout the school day. This was important for the observational field notes because some of the notes were taken in real time through observational notes, and some in reflection. The goal of this study was to understand how environmental education impacts social-emotional learning, and that includes time spent outside of the designated research time.

To conclude the research and data collection, the students completed a final survey. This final survey provided a space for the participants to reflect on their own experiences of outdoor and science exploration, and working in groups. This survey allowed me to have an individual perspective of the activities the participants were involved in. This also allowed the participants a safe-space to share anything they would like to change for future outdoor education activities.

Setting and Participants

"The school building has about it a natural environment. It ought to be in a garden, and the children from the garden would be led to surrounding fields, and then onto the wider country with all its facts and forces." (Dewey, 1915, p. 75). The setting of my research to be conducted was in a suburban elementary school south of Minneapolis, Minnesota. The school houses grades kindergarten through 5th grade, which consists of approximately 500 students. The students come from diverse racial, cultural, and

socioeconomic backgrounds. According to the National Center for Education Statistics (n.d.), roughly 30% of the students in the school received free and reduced lunch, which means that the school receives Title1 funding for the 2020-2021 school year (Natural Center of Education Statistics, n.d.).

The school grounds play an important part of this research because much of the data was collected outside of the formal classroom setting and in the outdoors. The school sits within a neighborhood with both single-family homes and townhomes. The road is relatively busy with ample crosswalks and pedestrian lights. The lawn is well-manicured and the softball fields maintained routinely. There is a playground with slides and swings, and a concrete space for children to play basketball or four-square.

My participants were my 2nd grade students for the 21/22 school year. At this time my class consisted of 25 students. There are 13 female students and 12 male students. Of those 25 students, two students receive special education services. One student has a noted peanut allergy. These second grade students fall within the primary-age range noted in chapter 1.

The research was designed with the participants in mind. Not only are the participants part of the research, but the outcome of the research and research findings may have a great impact on the participants. It is with this in mind that the research tool and method of collecting research was chosen to be observational field notes.

Data Analysis

As research was collected using observational field notes, the data was analyzed immediately. I used a data collection form to collect data while the participants were engaging in the explorations. The data that was collected focused on the social-emotional

learning goals of self-awareness, self-management, social-awareness, and relationship skills (Clark, n.d).

These behaviors were coded to allow me to make observations while facilitating the exploration for the participants. The following is a chart that uses the social-emotional learning goals put forth by Clark, and integrates those goals with the Design Squad roles created by my district while continuing to focus on the guiding question (see Table 3).

Table 3

Social-Emotional Learning Goals

Self awareness	Following directions the first time they are given
Self management	Getting self ready quickly and quietly without reminders Having all materials daily Staying within designated space Staying on task
Social awareness	Working within small group effectively Staying on task within small group Staying with the group
Relationship skills	Using positive language with peers Following rules and expectations Helping class and groupmates
Responsible decision making	Staying within designated space Using materials correctly Working with the group in a positive manner Maintaining role with the small group Transitioning between activities quickly

The participants of this research were young learners, 2nd grade students to be exact. Due to their age and the personal nature of this study, it was important to take all aspects of the research into mind. The form of research, data collection, data analysis, and

plans for how to share the data it is understood that all requirements for privacy have been and will continue to be met.

IRB requirements

The research was designed in a qualitative manner to include field observations and data gathered through weekly surveys. Parents of the participants were informed of their child's participation in this research through the use of my, the teacher's observations and student surveys. The parents and guardians were also shown the activities through the class SeeSaw website, these pictures will not be shared in this research due to student likenesses being used. These communications not only allowed the parents and stakeholders to have a glimpse into our classroom and routines, but also allowed them to see how their child was spending their time learning outdoors.

The site is my natural setting, or the school grounds. This space is used daily for learning and play. In order to obtain proper permissions for use of the grounds, I met with the administration and was granted permission. Parents of the participants were informed via email that their child will be involved in a research study using these forms of data collection: observations and surveys.

After reviewing the schedule set forth by the administration, it showed no specific time for science standards to be taught. It was inferred that the goal is to have the science standards integrated into other core subject areas. Based on the goals and design of this research, time was needed to be allotted each day to ensure that time is spent outdoors and learning about the environment, the goal is to have 20-25 minutes each day for this purpose. Integration into the other subjects was necessary to ensure that all standards and goals of subjects are being taught and learned with fidelity.

Conclusion

This research was designed with the hope to answer the question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?* As is discussed in chapter 3, there are overlapping goals in environmental education and social-emotional learning, especially for young or primary-age learners. This research was important to gain more understanding of the benefits of time spent outdoors and how to properly implement this into the formal classroom setting for all learners regardless of background and ability. Chapter 4 discusses the research findings and strives to answer the research question.

CHAPTER FOUR

Results

Overview

This chapter shares the results of the research that was conducted in an effort to gain insight into the question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?* This question was developed based upon the literature in chapter two and the researcher's own desire to gain a deeper understanding and insight into how an increase in time dedicated to environmental exploration and discovery may or may not impact the students' social-emotional learning throughout the school day.

Research Methods

The data was collected during the regularly scheduled school day using three different methods: student surveys, field observations, and teacher reflections. The student participants were engaged during their scheduled science time over three consecutive weeks. The setting in which the data was collected was an elementary school in suburban Minnesota. Each data collection tool was chosen and developed to provide a clear picture of the student participants throughout the school day, and how the additional time spent outdoors exploring and discovering the winter environment may or may not impact the social-emotional behaviors.

The research was designed to allow the student participants the opportunity to participate in different outdoor science exploration and discovery. The gradual release model was followed to allow the student participants the chance to gain understanding and to be released to work more independently and within a small group by the end of the

experience. The gradual release of responsibility model suggests that learning and work should shift slowly from an “I do, we do, you do” experience in an intentional way that begins with teacher modeling and ends with independent work (Frey & Fischer, 2013).

Surveys

Throughout the data collection process the students were given three surveys, one survey each week of the data collection period (see Appendix D). Each survey asked a specific set of questions that were developed to gain a deeper understanding of the students' preferences and feelings toward learning and exploring outdoors. The questions also took into account the students' feelings toward the science activities inside the classroom, meaning the packet work.

Field Observations

Field observations were made while the student participants were participating in the environmental outdoor science exploration and discovery experience. The field observation data collection tool (see Appendix C) was carried in a clipboard to allow the researcher to make in-the-moment observations and to gauge the student behaviors based upon the social-emotional learning goals outlined in chapter two (see Table 4). The field observation form was used for both the outdoor portion and indoor portion of the daily activities, thus the data was combined to include the whole outdoor science exploration and discovery experience.

Table 4

Social-Emotional Learning Goals

Self awareness	Following directions the first time they are given
Self management	Getting self ready quickly and quietly without reminders Having all materials daily Staying within designated space Staying on task
Social awareness	Working within small group effectively Staying on task within small group Staying with the group
Relationship skills	Using positive language with peers Following rules and expectations Helping class and groupmates

Teacher Reflections

The outdoor science exploration and discovery experience took place in the first half of each day, this was done to allow me, the researcher, the opportunity to reflect upon the experience and the behaviors of the student participants throughout the day. The reflections were taken at the end of each day while the student participants were out of the room to allow me time to write notes about behaviors displayed that were related to the social-emotional learning as well as the interpersonal relationships within the student participant population.

Data Collection: Week One

The first week of the experience was the “I do” week. This week was designed to allow the students to explore their outdoor space and to become comfortable within their surroundings while watching me guide the class through an initial experience and the

scientific method. Additionally, this first week afforded me the opportunity to ensure that all participants had the necessary clothing items to keep them safe while outdoors.

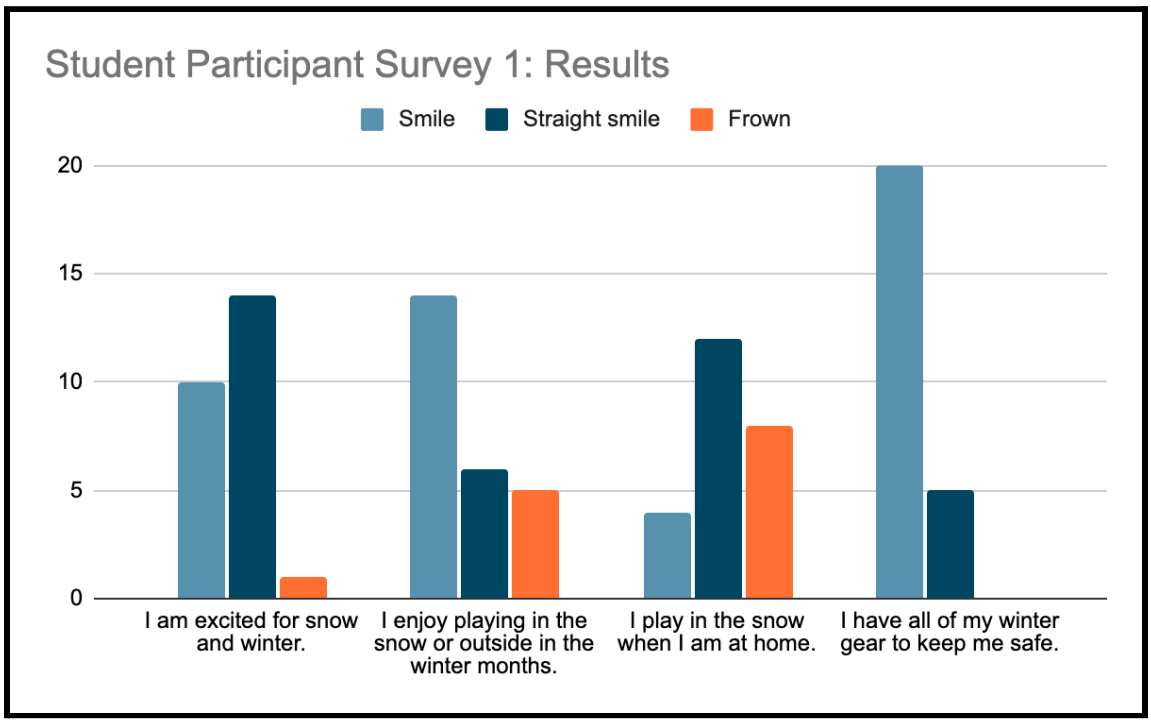
Within the first week of the experience, the students spent an additional 20 minutes outdoors each day. When the class came inside it was a quick pivot into the booklet work in a whole group setting, where I walked through the scientific process and the winter exploration booklet. During this time I made field observations and daily reflections.

Week One: Survey

In the survey for week one, all 25 student participants were surveyed prior to the outdoor science exploration unit. The participants were asked about their feelings toward winter weather and their prior experience with the outdoors (see Appendix D). The results showed that all but 1 student was looking forward to the winter weather and spending additional time outdoors. The results also showed that all student participants had enough winter gear to keep them safe in the outdoors (see Figure 1).

Figure 1

Week one student participant survey (n=25)



The student participant survey showed that overall most of the students felt positive about the upcoming winter weather, and all had some experience spending time outdoors. The last question, "I have all my winter gear to keep me safe", showed that all but five of the participants had the necessary winter items for spending time outdoors exploring, this gave me the opportunity to get the student participants the items they were missing.

Week One: Field Observations

During the first week of field observations, the student participants were able to spend five consecutive days outdoors. Each outdoor experience was at least 25 minutes long. The activities ranged from walking off the border of our outdoor "classroom", building snowmen and towers, and establishing expectations. The students worked

together in each of the activities in partners or in groups. These activities included building snowmen

Outdoor field observations. While outdoors, as the researcher, I made observations of behavior aligned with the social-emotional learning, as seen in Appendix A. I also used the Field Observation data collection, as seen in Appendix B, to collect and organize the data. Using these two tools I made real-time observations of student behaviors and interactions.

Throughout the time spent outdoors, the student participants engaged in a variety of winter activities that included snow and exploration. There were times during this experience when the students would be tasked with working in partners and in small groups to achieve a goal or a task, for example, building a snowman. During these outdoor exploration activities, I observed the students quickly finding partners or groups and working together in a respectful manner exhibiting many of the desired social-emotional behaviors (see in Appendix B) .

Indoor field observations. The experiment for week one was asking the question, 'How much water is in snow?' This experiment was guided by me in the classroom and walked through the steps of the scientific method as laid out in the week one packet (see Appendix E). The students followed along with the teacher researcher by observing the steps and how to complete the packet work, they also participated by turning and talking with their neighbors and answering questions.

The student participants overall participated appropriately and showed many of the desired and expected behaviors while working in the packet and doing the experiment (see Figure 2). As this was the "I do" portion of the experience it was to be expected that

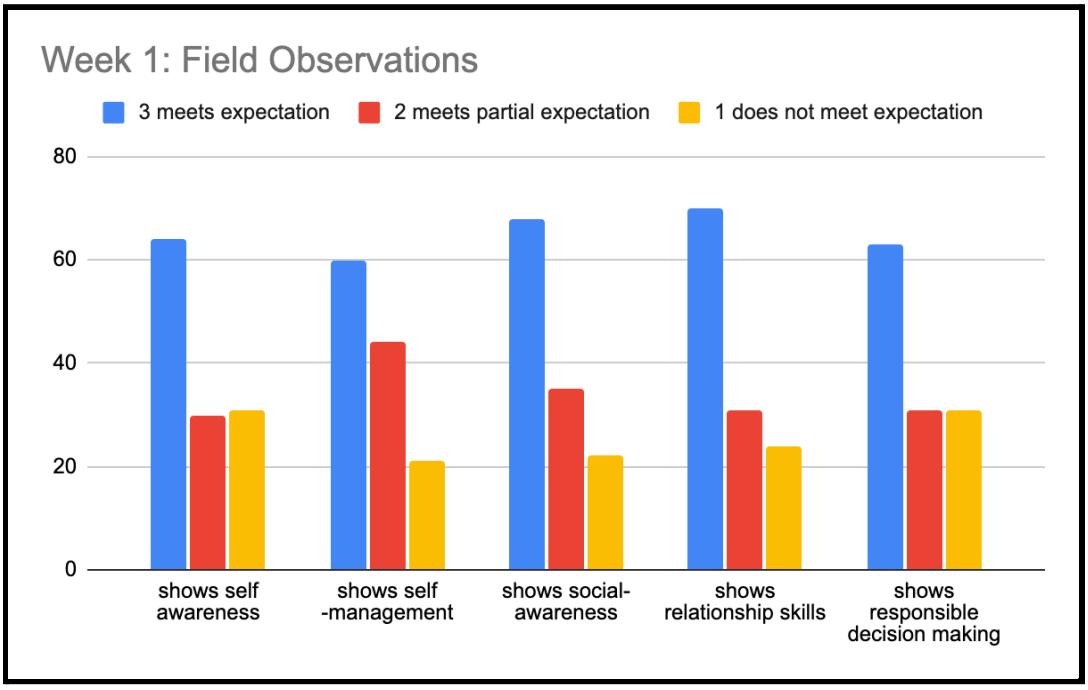
some undesirable behaviors would arise during this portion, such as a difficulty showing self- management during the listening and watching portion, or the indoor portion of the experience. As the researcher, I took special notice of the social-emotional behavior comparison between the time spent exploring the outdoor space and the time spent indoors. I was able to make observations and reflections upon the student participants' behaviors throughout the experiences and school day.

> The students did a nice job in the classroom showing self awareness, self management, social awareness, relationship skills, and responsible decision making. The participants were definitely more wiggly and distracted indoors rather than while we were outdoors. I can assume that this is because they didn't have the opportunity to actively do the work since this portion of the experience was the "I do", and the students were observing and listening to the teacher's thinking rather than completing their own packet. The experiment, on the other hand, was very engaging and the student participants were very engaged and the behavior concerns were minimal.

These observations showed that when a student is actively engaged in their learning they are able to move more positively toward the learning targets. Additionally, this showed that even though the students were more engaged in the physical, hands-on aspects they were still able to show social-emotional growth in the times they were not able to be hands-on.

Figure 2

Week One: Field Observations (n=125)



Throughout the experiences, both the indoor and outdoor components, I used the field observation data collection tool (see Appendix B) to collect the data related to the student participants' social-emotional learning (see Appendix C).

In the Week One: Observations (see Figure 1), the data collected showed that for each experience there were at least 60 times the students met the expectation for each social-emotional behavior. It also showed in week one, that the students had the hardest time with self management, with over 60 times being marked at a 2 or a 1 out of a total of roughly 125.

Week One: Reflections

The students were engaged in the outdoor experiences. Each day the student participants worked together in different winter activities. Throughout the week the

participants built snowmen together, snow towers, and designed snow chairs. Throughout the experiment, the students worked in partners and followed the researcher's directions. As a teacher observer, it was interesting for me to see that while outdoors the students worked together extremely well and chose a partner or small group which was contradictory to the time spent indoors. Throughout the first week experiment experience, the student participants worked with a partner. Prior to this experience I had many opportunities to observe student interactions with their peers, and reflected on how the students found and worked with partners outdoors and inside the classroom.

> It seemed as though some of the hierarchy of the classroom community fell away outdoors, without the four walls. The students were able to quickly find a partner and worked effectively together showing the desired behaviors while outside. As soon as we came inside to our classroom it seemed as though some of those nice partnerships were impacted by the space and the students fell into old habits and cliques.

The observation of student interactions was interesting for me because instead of trying to develop their perfect pairings, they found the closest person so we could move on as a class. It showed that when the students were actively engaged in their learning, I believe, they did not want to waste any time in order to move on with their activities.

Data Collection: Week Two

The experience during the second week is considered the, “we do” portion of the learning experience. This week was dedicated to the students not only participating in the process, but also being guided through the scientific method through the workbook as a

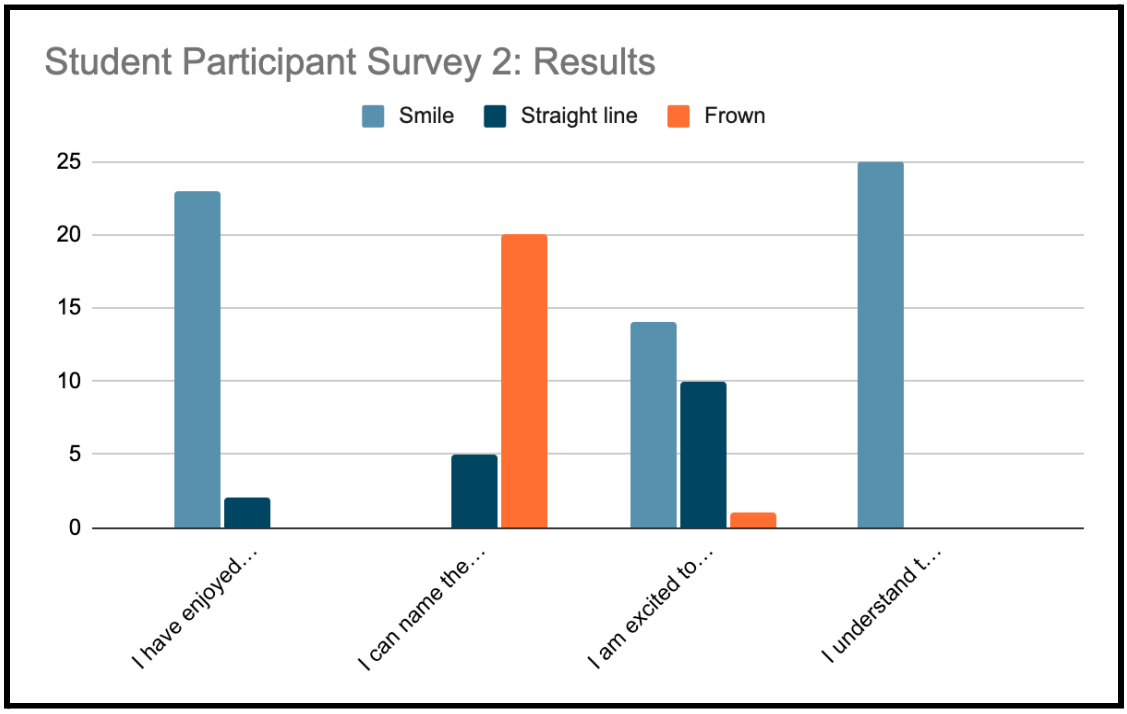
class (see Appendix D). During the second week of the outdoor exploration and discovery experience, the students spent an additional 25 minutes outdoors each day.

Week Two: Survey

In the survey for week two, all 25 student participants were surveyed. The questions were designed to gain a deeper understanding of the participants' current feelings about the science experiences, and their feelings about working together throughout the remainder of the experience. Overall, only two participants were not enjoying their additional time outside, and all students agreed to do their best work (see Figure 3) .

Figure 3

Week two student participant survey (n=25)



The student participants were surveyed during the second week of their experience. This survey was intended to gauge the students' attitude toward the experience thus far and to check to see their base knowledge of the scientific method.

The question, "I have enjoyed spending time outdoors learning and exploring" showed all but two students were enjoying the time spent outdoors for this specific learning experience. The second question, "I can name the steps of the scientific method", showed that only five student participants were able to identify the parts of the scientific method. Conversely, question five, "I understand that working in my Design Team means that I will have a job to do everyday, and I agree to do my very best", showed that all students were looking forward to the third week and more independence in the experience.

Week Two: Field Observations

The second week gave the participants the opportunity to be outdoors for their additional science exploration time. The second week outdoors was less structured and allowed the student participants the chance to explore freely and to create as they chose. The student participants also had the opportunity while indoors to work as a whole group to design the experiment. As a class we discussed different questions we could ask specifically about winter, snow, and cold. After a discussion we took a quick vote and the student participants chose to ask the question: Can bubbles freeze?

Outdoor Field Observations. The second week outdoors was interesting because the space that was the outdoor classroom had become so packed down that the group was forced to find a new space to learn and explore. The space was within walking distance but was not shielded from the wind. This allowed the student participants the opportunity

to talk about ways to keep warm, and build shelters. The student participants worked well together to explore their outdoor winter space. Without a guided exploration or activity allowed me to make observations of their social-emotional behaviors and how the participants chose to interact with one another.

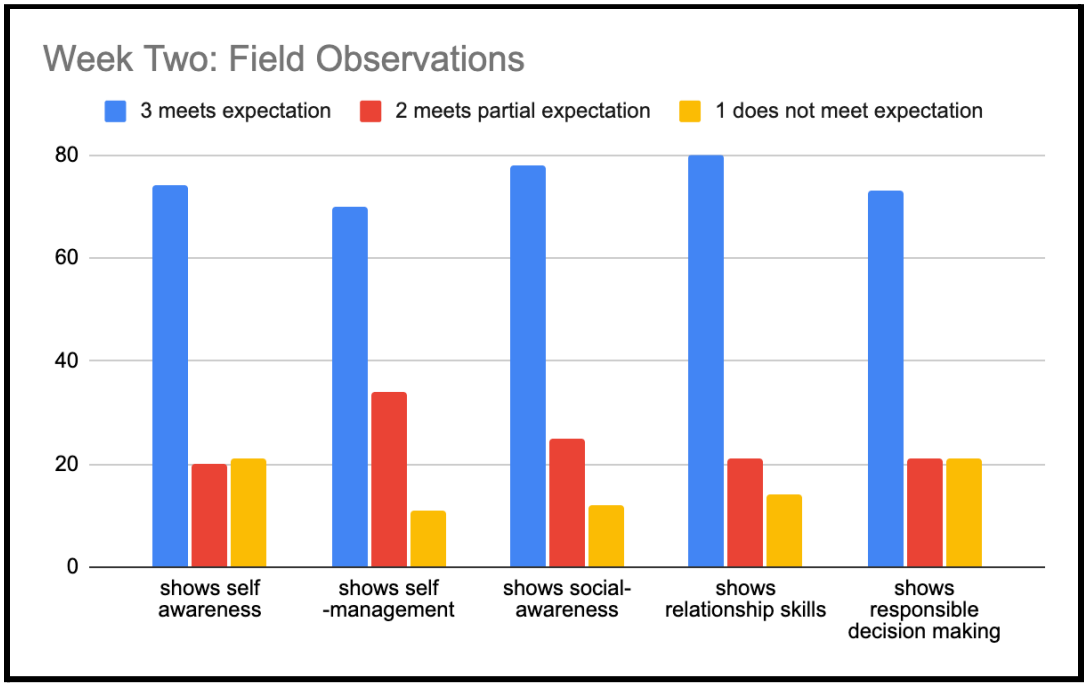
> Simply observing and not directly guiding the experience allowed me to really watch the participants' interactions with one another. I noticed how a student that struggles to make friends during our normal schedule found a way to connect with a group of kids building a snow wall. I don't usually get the opportunity to simply watch them interact and it was cool and eye-opening to see how they interact and who they choose to interact with.

This observation was particularly enjoyable for me not only as a researcher, but as a caring teacher. Watching how a student who requires support in their friendships being accepted by their peers without teacher involvement was positive social-emotional growth for all involved. Not only was the child able to engage with their peers, but their peers accepted them without my direction.

Indoor Field Observations. During the second week, the whole class worked together to complete the packet and to design the experiment. There was little to no time for the student participants to engage with each other during this time as it was very structured. I reflected upon the second week of the experience, "this time in the classroom was great because the students really got to take the time to do the work, but in a way that was correct and setting them up for success next week." We gradually stepped through the packet work as a whole-group to ensure that the students understood what was expected of them in the following week.

Figure 4

Week Two: Field Observations (n=125)



Throughout the experiences, both the indoor and outdoor components, I used the field observation data collection tool to collect the data related to the student participants' social-emotional learning.

In the second week of field observations, it was observed that students were showing a greater amount of desired social-emotional behaviors, or achieving a 3 on the data collection tool. An example of the students' growth in their social-emotional behaviors can be seen in the data collected for, "shows relationship skills", where 80 times the students were marked as showing behaviors that earned them a 3, and only 40 times were a 2 or a 1 for the same social-emotional behavior.

Week Two: Reflections

The student participants worked appropriately and positively throughout week two, "we do", experience. As a class, we chose the winter exploration experiment on whether a bubble freezes in cold temperatures. The question that guided the experience was engaging for the participants.

Throughout the second week, the students showed many of the social-emotional behaviors while working with each other well and worked thoroughly through the packet (see Figure 4). Based on the data collected and the reflective notes, it is my interpretation that the second week was the most successful for the students (see Figure 3 & Figure 4). During this week the students had the opportunity to work in the whole group setting. The students were also able to participate and engage more directly with the question and experiment.

Data Collection: Week Three

The third week was designed to be the, "you do" portion of the experience. This was the opportunity for the student participants to show what they have learned and to design their own experiment or experience in their own design teams. The student participants worked in their design teams that were chosen by me. I chose to keep the students within their table groups to maintain the focus on the experience rather than the groupings. Each student participant had a role within their design team (see Appendix A).

Throughout the third week of the experience, the temperature outdoors was dangerously cold, and therefore the student participants were not able to spend the additional 25 minutes outdoors, as they were in the previous weeks. Although this cold

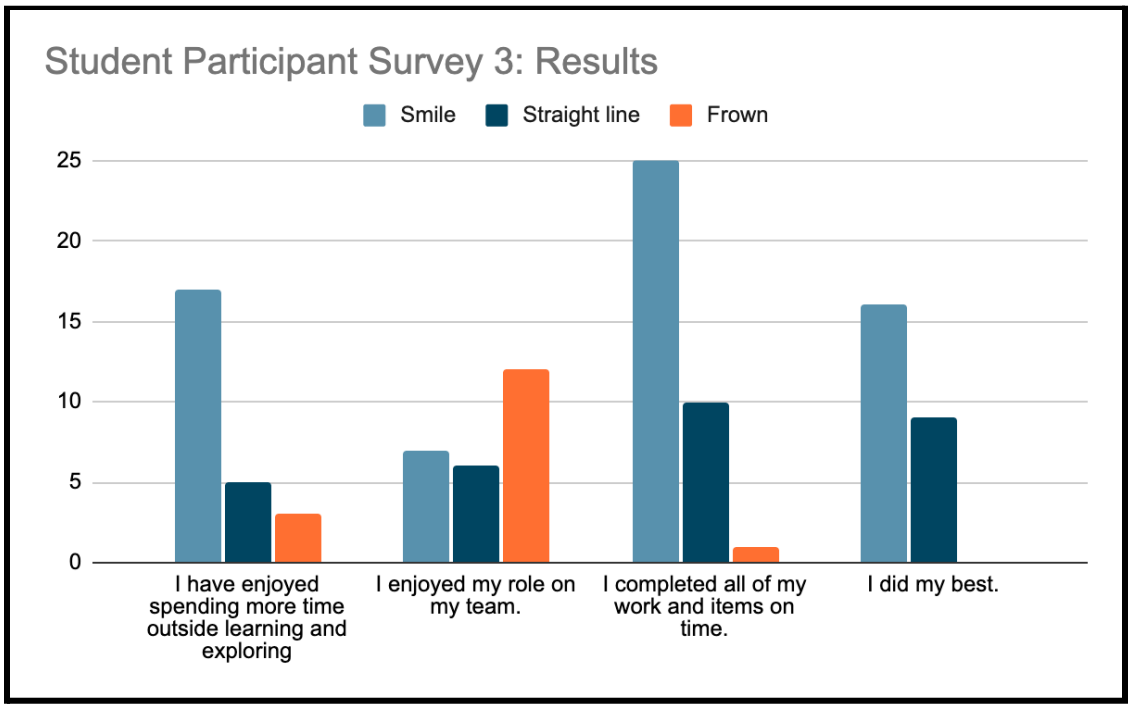
weather was unfortunate, it did not deter the student participants from spending this additional time designing their experiment.

Week Three: Survey

The week three survey was created to close out the experience and to gain an understanding of how the student participants felt about the increase in time spent outdoors for the winter science exploration and discovery unit. This survey showed that overall the students enjoyed the experience. It was noted that not everyone enjoyed their time working in their Design Team, which is understandable because not all of the student participants were able to have the roles they wanted. However, it was positive to see that all of the student participants believed they did their best throughout the experience.

Figure 5

Week Three: Student Participant Survey (n=25)



The surveys were designed in a way to gauge the student participant experience in a way that allowed them to be honest. Overall, the student participants gauged the experience as a positive one throughout all of the surveys, and they felt they did their best work. It was interesting to see that the students were not overall satisfied working in small groups and on design teams, as seen in the answers to the question, "I enjoyed my role on my team" (see Figure 5). I believe that this was due to the responsibilities of each role, and the majority of the students wanting to be the leader of their team. Additionally, I did not allow for the student participants to choose their own teams but rather assigned their teams and their roles within the team. It would be interesting to see if there was more flexibility and choice in this, would the students have had a more positive experience working within their design team.

Week Three: Field Observations

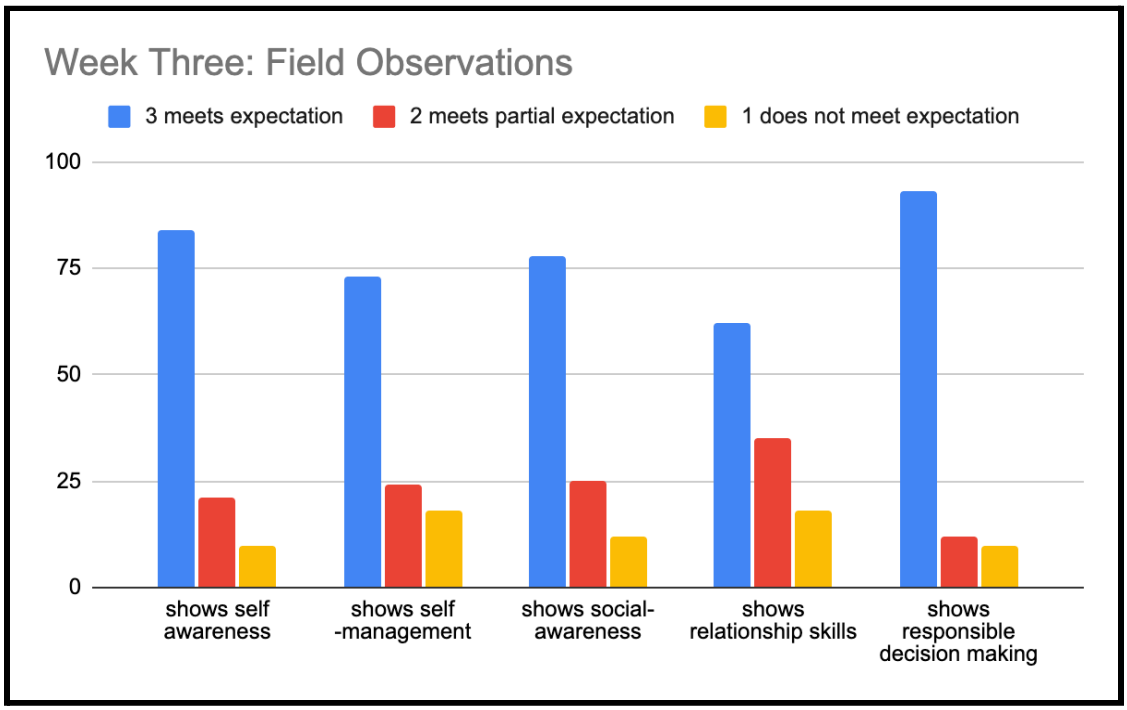
Outdoor field observations. Due to the extremely cold weather, the student participants were not able to spend time outdoors during the third week. Therefore, there was no data collected while outdoors.

Indoor field observations: During the third week of the experience the student participants spent their entire science time indoors due to the cold weather. This allowed the participants some additional time to work in their design teams designing their experiment. The students worked overall in a positive manner within their design teams. "It was interesting to watch the students work together after following the gradual release model. I noticed that one of my students, who is typically a leader in the classroom, had a very hard time working within their design team. They seemed to have a difficult time sharing responsibility with their teammates." This reflective quote from my notes and

reflections showed that students have different strengths and comfort levels. I included this because it showed that although this particular student participant is a leader in the classroom on a typical day, they had a difficult time sharing responsibility and relinquishing control to their teammates, and that although working in teams was not necessarily the intended learning outcome it was beneficial for this student participant in particular.

Figure 6

Week Three: FIeld Observations (n=125)



The field observations of week three, show that more students were showing desired social-emotional behaviors more often than not, or achieving a 3 for their behavior rather than a 1 or a 2. Specifically, in “shows responsible decision making”, the student participants were marked with a 3 nearly 100 times, and a 1 or a 2 less than 25 each.

Week Three: Reflections

The students engaged in their small-group experience. The students were split into five groups of five. The goal of the third week of experiences was the "you do" experience, where the students work together to walk through the scientific method and to develop an experiment. Each student participant was given a Design Team Role (see Table 5).

Table 5

Design Team Roles

Role Title	**Role Duties**
Leader	● Shares the task ● Makes sure everyone has a chance to share
Speaker	● Asks the teacher questions ● Shares groups ideas with class
Recorder	● Takes pictures of the group ● Posts pictures to SeeSaw
Supplier	● Collects and returns supplies
Time Keeper	● Sets timer for tasks ● Gives updates on timing

Interestingly, a student who is a natural leader within the classroom had the most difficult time working within their team. This student participant was upset with their role, and their team. They were given the role of leader within their design team, and yet had a hard time thinking flexibly and allowing their teammates to participate with the packet work and experiment.

Conclusion

The outdoor science exploration and discovery experience was designed and created in an effort for the researcher to gain insight into the question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?* The experience was designed to fit into the regular classroom schedule over a three-week period. I gave weekly surveys, made field observations inside and outside, as well as reflected upon the student participants' behaviors as aligned with social-emotional learning goals using a 1, 2 , 3 system. The data was transferred into bar graph format to show behavioral comparisons throughout the experiences. Overall, the surveys showed that the student participants had a positive experience throughout the three-week period. Additionally, the field observation data shows that more desired behaviors were observed toward the end of the experience compared to the first week.

CHAPTER FIVE

Conclusion

Introduction

Creating experiential learning that engages the student learners is my goal as a teacher. I work to develop hands-on and engaging lessons and experiences for my students that allow them to gain knowledge that will last beyond their 2nd grade year. This was where the passion and excitement for this research project and capstone were born. I wanted to create a way for my students to experience science through doing outside of the classroom while being able to observe how this time outdoors in a less-structured space impacts their social-emotional learning and behaviors throughout the day. My research was conducted, designed, and delivered in a way that allowed me to observe the interactions of my students with each other. My goal was to make observations that would help me answer the guiding question: *How do environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?*

In this final chapter, I address my major learnings as the researcher, possible implications and future research based upon my own findings, as well as how I intend to share my research findings with invested parties. I also discuss what some of the limitations of the research were while the data was being collected.

Major Learnings

The development of this research was to gain insight into the social-emotional learning of 2nd grade students and how outdoor science exploration and discovery impacts that learning. While gathering the data I had the opportunity to observe and

reflect upon behaviors and interactions during the specific activities outlined in chapter 4, as well as throughout the school day. When I designed my experiences and activities for my student participants, I was able to take into account the specific participants' needs, as well as the dynamic of the formal classroom setting. Having this prior knowledge gave me the opportunity to spend my data collection time focused on my own observations, reflections and learning more about the importance of scaffolding, engagement and participation, and peer relationships.

Scaffolding

As mentioned in chapter 2, in order to implement nature education in the formal education setting, teachers need to not only provide time and space, but also need to scaffold expectations and tailor the activities to the needs of the children present (American Forest Foundation, 2019). I chose to have my data collection and research span three weeks in order to properly scaffold expectations and routines. By taking the time to slow down and teach explicit expectations in the beginning of the data collection period, or front-loading this teaching, my student participants were able to participate in the activities in a positive and successful manner.

When we met outside for the first time, as a class, we set expectations and physical boundaries. As the weeks went on our boundaries expanded and the students were able to explore and discover outdoors without teacher-led activities, in a more natural and play-based way. These boundaries were important because they not only kept the students safe, but also allowed the student participants to engage in a more positive way without redirection and reminders. Frontloading this explicit teaching was integral to the success of the outdoor activities.

Future implementation. Moving forward I will take this understanding of the importance of front-loading teaching expectations and behavior into all aspects of the classroom. This will set the students up for knowing their expectations and feeling a sense of success in the classroom right away. Additionally, taking time to build community shows the students in the classroom that their teacher is kind and caring and supports every aspect of their learning and growth. As we begin the school year I can set up expectations and boundaries with my new class. I will also use this learning as I teach a new unit or concept, slowing down and teaching explicitly in the beginning.

Engagement and Participation

The data collected showed many connections between the science exploration and discovery experiences and the student participants' social-emotional learning with regard to their observable behaviors. The figures showed that as students were able to have a less teacher-led and structured experience that they were able to show more positive and desirable behaviors throughout the entire school day (see Figure 1-6, in Chapter 4).

The activities that were created and developed were intended to be engaging in a way that encouraged students to learn while having fun, and to experience an increase in their independence in the classroom. As the researcher, I was able to observe my students participating in the activities in a more meaningful way. For instance, I watched a student who is rather uninterested in school watch his friends having fun and choose to participate. He started the first week leaving the classroom without his winter gear on so he could not participate in the outdoor activities, to being the first one ready by the end of the week. This showed me that making the learning fun and engaging can encourage reluctant learners to join by their own choice rather than teacher force.

Future Implementation. As a teacher, there are times that I may feel the need to force-feed learning to our students in order to meet the educational goals or learning standards. It is my goal for the learning to always be engaging and fun but not everything is easily tweaked to be taught that way; however, my research showed me that planning and preparing to teach in a way that is engaging can afford my learners to gain knowledge in a way that encourages a deeper understanding and positive connection to school and learning. By being engaged in what they are learning I found that it can take away many of the behavior concerns and allow the students to focus on their tasks and activities without all of the minuta of the day. When an activity is fun, engaging and relevant it not only allows them to learn the intended information, but it also allows them to feel a sense of success and connection to their school and learning that encourages life-long learning.

Peer Relationships and Interactions

As the researcher, I had the opportunity to not only create the experiences but to also observe the student participants engaging in the different activities throughout the data collection period and learned a lot. A major learning for me was observing how the students interacted outdoors with their peers versus in the classroom. I noticed that while outdoors, the student participants were quick to work in teams and engage in the activities regardless of whether or not they are typically friendly in the classroom. Conversely, in the classroom it was difficult for them, in the beginning of the experience, to choose partners quickly and interact in a positive manner. Redirections and reminders about being kind were needed more often in the classroom compared to outdoors when it came to the students interacting with one another. I believe that this was because the

students felt not only engaged in their discovery and exploratory learning, but were also having a fun and playful learning experience, and the desire to continue learning and engaging in the activities outweighed the need for peer approval.

The student participants worked together within design teams during the third week of the experience. During the third week, each student had a job to do within the design team. I took into account their desires for their jobs or roles, but also used what I knew about the students and who I felt would be good in each role. I was surprised to see how some students that were perceived, by me and themselves, as leaders had a difficult time interacting with their design team in a positive way. Throughout the Covid-19 pandemic, a lot of protocols have changed within the classroom and one of those in my district was the ability of students sharing materials and working in small groups. This year those protocols were lifted for the first time since my students were in kindergarten. Observing these interactions of how certain children had a hard time sharing responsibility and working positively with others showed me the importance of, once again, scaffolding teaching and the benefits of cooperative learning.

Future Implementation. Moving forward in teaching I will take into consideration what I have learned and observed from the peer interactions of my students during these experiences. I will take time to pre teach group expectations and remember that some students need more explicit instruction on how to work with others. I will also work to create hands-on and engaging learning experiences that push my students to extend themselves out of their comfort zone of peers and friends in the desire to learn more.

Conclusion

In conclusion, I believe that my research not only supports, but shows the correlation between environmental education and social-emotional learning in the general education classroom. My student participants spent three weeks actively engaged in their activities that included spending additional time outside, in Minnesota, in February. My participants showed that without the four-walls of a classroom they can learn and grow in a way that not only supports their academics but also their social-emotional learning. When they were outdoors they focused on the exciting tasks rather than their friendships and making positive decisions about themselves and their actions. My research shows that time spent in an integrated environmental education unit supported the student participants' growth in their desired behaviors inside and outside the classroom.

I had the opportunity to design and deliver three weeks of learning activities that incorporated science standards, environmental and outdoor education while observing the impact on the social-emotional learning of my student participants during the winter months in Minnesota. Looking back on 2nd grade, I am hopeful that my students will remember this experience as fun and engaging and that they learned about their own environment. For myself, I learned that I am able to create innovative learning experiences for my students that are multifaceted and have cross-subjected integration.

Revisiting the Literature

The research was designed to incorporate science education while exploring the natural environment. I believe that although a lot of emphasis was put on the importance of environmental education in Chapter 2, this type of learning would be or should be categorized as outdoor education. Cotic et al. (2020) described outdoor education as the

combining of everyday school activities that would traditionally take place within the confines of the classroom and moving them to the outdoors. Additionally, this research was designed and created with the intention of creating authentic learning opportunities for the student participants in a space that allowed for experiential learning. Authentic learning is meaningful to the learner and relates to the real world while providing a hands-on and kinesthetic approach to education and learning (Cotic et al., 2020).

Teaching outside of the classroom is not always supported by teachers and administration due to the emphasis on rigor in the elementary setting, as well as the safety of the school surroundings and comfort of teachers (Maynard & Waters, 2007). However, when reviewing the literature and reflecting upon my own research, I can say that increasing time spent outdoors in the science subject not only maintained the expected rigor but also engaged the students.

When looking back at the literature, I can also see the importance that teachers from some Scandinavian countries have put on increasing time spent outdoors because of the benefits they have seen in their students such as the physical, emotional, and intellectual development of learners (Humberston & Stan, 2009). Additionally, other teachers around the globe have noted other outcomes of increased time spent outdoors such as an increase in confidence, self-esteem, independence, and better social interactions among others (Waite, 2011). My own research supports what these teachers before me observed and noticed about spending time outdoors learning, exploring and discovering.

Based upon the reviewed literature, it can be concluded that time spent outdoors not only supports environmental education but also social-emotional learning. Now,

being able to include my own research, I believe that my research begins to draw connections between an increase in time spent outdoors exploring and discovering the natural environment and the social-emotional learning and behaviors of 2nd grade student learners.

Implications

The data collected from this research showed that the majority of students participants had a positive reflection with regard to the science discovery and exploration experiences. Additionally, the data shows the correlations between this science discovery and exploration and the social-emotional behaviors or desired behaviors in the general education classroom setting.

Get outside!

As a reflective teacher, it is important to look at what works and what does not work and adjust accordingly to ensure that my students are receiving the best possible educational experience. The research shows that being outside is not only beneficial for the students' emotionally, physically, and intellectually (Humberstone & Stan, 2009). My research not only supports these previous findings but also shows that social-emotional learning and peer relationships can benefit from outdoor education. With this in mind, I think that teachers should embrace being outside of the classroom and integrate this into more subjects throughout the day. Additionally, teachers should not only bring "the good kids" out, or go outside "on a nice day", but head outdoors in the middle of winter to encourage a connection to the environment throughout the year.

Outdoors for social-emotional learning and support outside of the classroom

Aside from teaching outdoors and integrating environmental education into the classroom routine, I believe that schools should use the outside space for the social-emotional needs of their students. I have students in my classroom that meet with counselors, social workers, and have daily check-ins with the Dean. I think that rather than taking a walk through the halls it would be more beneficial, based on my research, to get outside and enjoy fresh air.

My research shows the correlation and connection between social-emotional learning and the outdoors. Additional research could be done on how the outdoors can be used to foster social-emotional learning and behavior needs outside of the classroom. I would be interested in seeing how integrating the outdoors into 504 and IEP plans as restorative practices might benefit these students. By this I mean including time spent outside of the school building everyday for students who may have acknowledged and expected difficulties in behavior, in addition to recess, to observe and document how that time outside may or may not impact the rest of the school day. This sort of safe space and restorative practice allows a child to not only see the desired behaviors but also have the opportunity to change their undesired behaviors (Clark, n.d.). The teacher, counselor, social worker or whomever is supporting the child during this time would need to scaffold the learning and teach boundaries, but this sort of research could be beneficial to students with 504 and IEPs in place around the world.

Limitations

The limitations of this study were fairly minimal. The research was designed to be flexible with regard to the student participants' needs, as well as the setting having been

in Minnesota during the winter months. Although many things were considered when designing the research: weather, winter gear, and absences, these are still considered limitations because they did either directly or indirectly impact the research.

Cold Weather

The data collection was conducted in three consecutive weeks during the month of February in Minnesota. During the month of February, we experienced five days over the three-week period that required the students to stay indoors for safety precautions when the windchill fell below 0 degrees. During these days, the research shifted to being strictly indoors. Although the student participants were not able to get outside and explore their space, they were able to talk about the winter and prepare for future days.

Attendance

Over the data collection period, many students were absent due to common winter colds or due to Covid-19 protocols. Although students miss school quite often during the school year, this is considered a limitation for the research because it causes students to miss learning points and in some instances not be able to participate in experiments or outdoor exploration experiences.

Conclusion

As a teacher, in my opinion, it is important to do your best to plan for the unexpected. With this in mind, this research was designed to be quite flexible. Although there were only a few limitations to the research, these limitations still may have impacted the data. Not everything can be foreseen and being flexible in design and delivery is an intrical part of any teaching and learning experience.

Future Research

I believe that the data collected shows that there are connections between the science discovery and exploration and social-emotional learning, as well as the time spent outdoors and the student participants' positive feelings toward their learning. With this in mind I feel that further research on the benefits of outdoor and environmental education in the modern classroom could be done.

Making comparisons

The research, as mentioned in chapter 2, shows the interpersonal benefits of outdoors education including emotional, physical, and intellectual development of learners (Humberston & Stan, 2009). I think it would be interesting to compare schools with a strong outdoor and environmental education initiative to schools without that same push and encouragement to integrate outdoor education in the general education classroom and how these schools rank in community satisfaction and based on state test scores.

Unexpected Integration

Science tends to lend itself most easily to be taught outside the four-walls of the formal classroom. The NGSS- standards, as briefly discussed in chapter 2, understand the need for science to be easily integrated throughout the day and were designed in this way (Luginbuhl, 2019). However, just because science is a rather flexible and integrable subject does not mean that it is the only subject that can be taught outdoors. I think that future research on the integration of outdoor and environmental education in other subject areas would be interesting.

Future research could be on the integration of outdoor exploration and poetry, using five senses to write poems about the environment. This research could be similarly structured to my research, but have an emphasis on the integration of science and language arts with a focus on a specific unit such as poetry. The research might measure the engagement and writing quality of the student participants.

Conclusion

In conclusion, future research on the benefits of environmental education may lead to a more structured and supported push for this type of teaching and learning in the general education classroom. As a teacher, I believe that it is important to listen to the research and adjust my practices to what best serves my student population, and environmental education programming provides the space for learners to not only explore the world around them but to learn from their surroundings.

Communicating Results

This data collected will be shared in a way that shows the correlations between time spent outdoors and the social-emotional learning of my 2nd grade students and how this may be integrated into the general education classroom. As the researcher, it was my duty to collect the data with the intention of sharing it with all interested parties. When it comes to students those parties include school administration and staff as well as parents.

Administrators and Teachers

The results of this research will be shared with the administration and staff of the school that was approved as the setting for this research. I will use the data collected to show the correlation between social-emotional learning and an increase in discovery-based science experiences for the students during the regular school day. This

information is significant for the administration and staff of this school setting because, in my opinion, it shows a connection between the science discovery and exploration as well as an increase in time spent outdoors, and the social-emotional learning and desired behaviors of the student participants. This information may be able to encourage teachers and staff within the building to take their class outdoors to explore the school grounds in structured and unstructured ways.

Parents and Families

No one should be more invested in a child's well being than their parents and family. I strive to have open communication with families throughout the school year and during the research period was no different. The highlights of the research were shared with parents each day. I took pictures of the students while participating in the activities and shared them with the families in our class SeeSaw. The parents were able to see what we were doing and share words of encouragement with their children.

Conclusion

For nearly 250 years educational theorists have spoken about the benefits of environmental education in the education of all learners. The purpose of this study was to gain deeper knowledge and understanding of the connectedness of environmental education and social-emotional learning. This is the basis of the research question: *How does environmental science exploration and discovery support the social-emotional learning of 2nd grade learners?* This question was an important one to ask as it pertains not only to the attitudes and beliefs of environmental education in our youngest pupils, but also looks at how integrating and including environmental education into the general education setting impacts a child's personal development.

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Appendix A

Design Squad Roles

Role Title	Role Duties
Leader	● Shares the task ● Makes sure everyone has a chance to share
Speaker	● Asks the teacher questions ● Shares groups ideas with class
Recorder	● Takes pictures of the group ● Posts pictures to SeeSaw
Supplier	● Collects and returns supplies
Time Keeper	● Sets timer for tasks ● Gives updates on timing

Appendix B

Social-Emotional Learning Behaviors

Self awareness	Following directions the first time they are given
Self management	Getting self ready quickly and quietly without reminders Having all materials daily Staying within designated space Staying on task
Social awareness	Working within small group effectively Staying on task within small group Staying with the group
Relationship skills	Using positive language with peers Following rules and expectations Helping class and groupmates
Responsible decision making	Staying within designated space Using materials correctly Working with the group in a positive manner Maintaining role with the small group Transitioning between activities quickly

Appendix C

Field Observation Data Collection Form

Date of Observation: ___/___/____ Location of Observation/ Activity:___

Student (#)	Shows Self-Awareness	Shows Self-Management	Shows Social-Awareness	Shows Relationship Skills	Shows Responsible Decision Making	Key: Meets Expectation = 3; Meets Partial Expectation = 2; Does not Meet Expectation = 1 Teacher Observation Notes:

Appendix D

Surveys

Name: _____

I am excited for snow and winter.	
I enjoy playing in the snow or outside in the winter months.	
I play in the snow when I am at home.	
I have all of my winter gear to keep me safe. *Winter coat, snow pants, hat, water-proof gloves and boots* *Circle what you are missing*	

Who do you play with outside in the winter? *Circle all that apply*

Parents Mom/Dad	Siblings Brother/ Sister	Friends	Myself	I don't like playing outside in the winter

Name: _____

I have enjoyed spending more time outside learning and exploring	
I can name the steps of the scientific method.	
I am excited to be able to work with a Design Team.	
I understand that working in my Design Team means that I will have a job to do everyday, and I agree to do my very best.	

Design Squad Role

Circle the role that you would prefer to have:

Leader Speaker Recorder Questioner Timer

Name: _____

I enjoyed working and exploring outside.	
I enjoyed my role on my team.	
I completed all of my work and items on time.	
I did my best.	

Did you enjoy this type of science? Why or why not?

_____

_____

_____

Appendix E

Work Books

Winter & Snow Discovery and Exploration Science

Week 1: Teacher Work

Name:

_____

Week 1, Day 1 - Make observations:

Date: _____-_____-_____

Temperature: _____

Weather:

 What did you see?	_____ _____
 What did you feel?	_____ _____
 What did you taste?	_____ _____
 What did you hear?	_____ _____
 What did you smell?	_____ _____

Week 1, Day 1- Ask a Question:

Write 3 questions you have about snow or winter:

1.

2.

3.

Put a circle around the number of your favorite question.

Week 1, Day 2- Develop a hypothesis:

Date: _____-_____-_____

Temperature: _____

Weather:

Write the question the class will be exploring this week.

Class Question:

Write the hypothesis the class decided on together

Class hypothesis:

Week 1, Day 3- Develop a hypothesis:

How could we test our hypothesis?

What order should we do things? What materials will we need?

Writing	Picture
First, _____ _____ _____	
Then, _____ _____ _____	
Next, _____ _____ _____	
Finally, _____ _____ _____	

Week 1, Day 4- Test the hypothesis:

Date: _____-_____-_____

Temperature: _____

Weather:

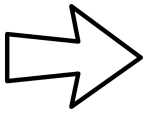
My Research Notes	

Week 1, Day 5- Share your results:

Date: _____-_____-_____

Temperature: _____

Weather:

 What do you conclude?	
 What surprised you?	
	

What would you change for next time?	

Winter & Snow Discovery and Exploration Science

Week 2: Together Work

Name:

_____

Week 2, Day 1 - Make observations:

Date: _____-_____-_____

Temperature: _____

Weather:

 What did you see?	_____ _____
 What did you feel?	_____ _____
 What did you taste?	_____ _____
 What did you hear?	_____ _____

 What did you smell?	_____ _____

Week 2, Day 1- Ask a Question:

Write 3 questions you have about snow or winter:

1.

2.

3.

Put a circle around the number of your favorite question.

Week 2, Day 2- Develop a hypothesis:

Date: _____-_____-_____

Temperature: _____

Weather:

Write the question the class will be exploring this week.

Class Question:

Write the hypothesis the class decided on together

Class hypothesis:

Week 2, Day 3- Develop a hypothesis:

How could we test our hypothesis?

What order should we do things? What materials will we need?

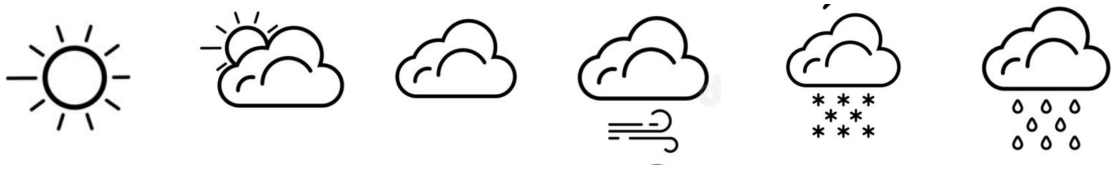
Writing	Picture
First,	
Then,	
Next,	
Finally,	

Week 2, Day 4- Test the hypothesis:

Date: _____-_____-_____

Temperature: _____

Weather:

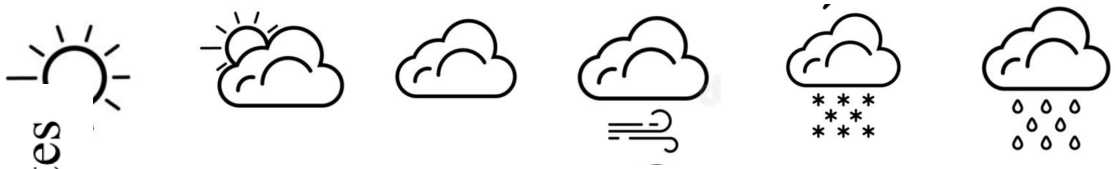


Week 2, Day 5- Share your results:

Date: _____-_____-_____

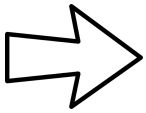
Temperature: _____

Weather:



My Research Notes

) you conclude?	
What surprised you?	

 What would you change for next time?	

Winter & Snow Discovery and Exploration Science

Week 3: Group Work

Name:

_____

Design Team Role:

_____

Week 3, Day 1 - Make observations:

Date: _____-_____-_____

Temperature: _____

Weather:

 What did you see?	_____ _____
 What did you feel?	_____ _____
 What did you taste?	_____ _____

 What did you hear?	
 What did you smell?	

Week 3, Day 1- Ask a Question:

Write 3 questions you have about snow or winter:

1.

2.

3.

Put a circle around the number of your favorite question.

Week 3, Day 2- Develop a hypothesis:

Date: _____-_____-_____

Temperature: _____

Weather:

Write the question the class will be exploring this week.

Class Question:

Write the hypothesis the class decided on together

Class hypothesis:

Week 3, Day 3- Develop a hypothesis:

How could we test our hypothesis?

What order should we do things? What materials will we need?

Writing	Picture
First,	
Then,	
Next,	

_____ _____	
Finally, _____ _____ _____	

Week 3, Day 4- Test the hypothesis:

Date: _____-_____-_____

Temperature: _____

Weather:

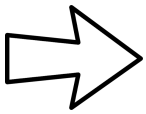
My Research Notes

Week 3, Day 5- Share your results:

Date: _____-_____-_____

Temperature: _____

Weather:

 What do you conclude?	
 What surprised you?	
 What would you change for next time?	