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Teaching Children to Learn, Not to Test

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By

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Thesis Abstract

The theory of Experiential Learning states that children develop knowledge and skills through experiences outside of the traditional classroom setting. The knowledge gained from these experiences is more long lasting and more enjoyable to students than the traditional rote memorization approach.

The focus of my thesis will be to analyze the theory of Experiential Learning in a first grade classroom during my year in the Education Program at Western Oregon University. I will be designing lessons around principles founded by John Dewey, the father of experiential learning, to teach a Science unit in a first grade classroom. The science unit will focus on the life cycle and structure of insects while implementing hands-on learning opportunities at a first grade level in compliance with the state-adopted Next Generation Science Standards for First Grade Science. The lessons will also seek to enhance the personal interest in the subject area. I plan to implement these lessons in a first grade classroom in the Dallas School District during my year of student teaching.

Literature Review

The purpose of this research study is to determine if the use of Dewey's experiential learning theory in science education increases students' content knowledge and affect towards science. Additionally I will be examining the possibility of incorporating Deweyan theories into the modern classroom setting. In this literature review I will examine a variety of different resources that both support and refute the use of experiential education in the classroom to best support and understand the previous research done regarding this theory.

In 2001, President George W. Bush enacted what is commonly known as the No Child Left Behind Act (NCLB). This act set new guidelines for the students and teachers of America. In order to receive federal funding, states were required to adopt the criteria of NCLB and meet the requirements by the 2014 deadline. NCLB generated "a stronger emphasis on reading, especially for young children" (OSBA, 2013) and emphasis in mathematics as well. In fact, all states were required to "set annual targets with the end result being all students perform[ing] at 100% proficiency in reading and math" (OSBA, 2013).

While these goals are commendable, failure on the schools part to meet these requirements carried consequences. These successes and failures were measured by the states' yearly progress reports in which the state was responsible to measure the academic progress of each individual school. If the school was considered failing the first year, it was placed on a school improvement list. Failure for the second year in a row permitted students to transfer out of the school. The penalties for the schools grow more severe for every consecutive year considered a failure. By the

fifth failing year, the "schools must be significantly overhauled, possibly taken over by the state or private industry" (OSBA, 2013). When this occurs schools may close their doors, sending pupils scattering to the surrounding schools in the district. Whenever possible, closing schools is avoided and a different path is chosen. Unfortunately, closing schools has occurred in the last several years as a result of failing for 5 consecutive years.

In 2001, the 2014 deadline seemed like an adequate amount of time to get the schools in American to 100% proficiency levels in mathematics and reading. However, the 2014 deadline has come and gone and our proficiency levels in mathematic and reading are nowhere near the 100% proficiency we were striving for. For example, in the 2012-2013 Oregon school year, only 25% of 4th grade students were considered proficient in reading and only 33% were considered proficient in math (Halvorson, year). Only one year before the deadline and as a country we are faced with the reality that our students are not reaching the desired proficiency levels. With only one school year to gain 75% in reading proficiency and 67% in mathematics, the states appealed to the federal government for a possible exemption from the awaiting penalties.

Oregon's waiver was granted on July 18, 2012, and provided a one-year extension from the NCLB requirements (OSBA, 2013). Multiple states across the country also applied for NCLB waivers. Provided that these states demonstrated a "plan of attack" for reaching the levels the government desired, the waivers were granted as a way to relieve some of the stresses on the school districts.

The main problem that has arisen from the NCLB requirements these

legislations is the teaching that is occurring in schools across the country. Student interest has diminished as teachers attempt to prepare the students to pass the state-regulated, high-stakes tests. Tanner (1997) states it perfectly when she claims

> the political use of test scores has caused students motivation and interest to be put on the back burner in many classrooms because the urgency for high scores makes everything else seem either secondary in importance or of no importance whatsoever (p. 43).

Tanner is stating that as a country, we have become more interested in the test scores we receive from students rather than their interest in subject material and learning. Student motivation is also considered to be of lesser importance in comparison with the achievement of test scores.

In many schools it has become essential students pass these tests in order to receive funding and keep the school doors open. Privileges such as "teacher awards or sanctions, administrator freedoms, school funding and even the existence of the school itself" (Martin, 2009, p. 67) rely on the results of these test scores, shifting an enormous amount of responsibility on the students and teachers to ensure students receive passing scores. Teachers have become hyper-focused on reading and mathematics in order for their students to receive these passing scores, because without these scores the future of the schools, and therefore their jobs, are in jeopardy.

Because the 2014 deadline has arrived and our proficiency scores are still

lacking the improvements we had hoped to see, it is important to look at educational pedagogical theories that may provide practices that encourage more meaningful learning in our schools. One of these theories is the theory of Experiential Learning, developed by John Dewey. Dewey (1938) reminds us that:

> [t]he history of educational theory is marked by opposition between the idea that education is development from within and that it is formation from without; that it is based upon natural endowments and that education is a process of overcoming natural inclination and substituting in its place habits acquired under external pressure (p. 17).

This means that we can either view knowledge as originating from within the child or as something that we place within their minds as teachers. Students "bend" to the rules and knowledge placed upon them, rather than using their own previous knowledge as a foundation for any new material learned. In this idea, the "teachers are the agents through which knowledge and skills are communicated and rules of conduct enforced" (p.18). Teachers have become more like drill sergeants rather than facilitators of learning. Dewey claims that we need to acknowledge the "organic connection between education and personal experience" (p. 25) and allow students interest to guide learning through experiences in the classroom.

Our current method of learning and instruction is frequently called the "banking" concept of education. Paulo Freire, another father of experiential education, explain that when using the "banking" concept

> 'Education thus becomes an act of depositing, in which the students

> are the depositories and the teacher is the depositor. Instead of communicating, the teacher communiques and makes deposits which the students patiently receive, memorize, and repeat...the scope of action allowed to the students extends only as far as the receiving, filing, and storing the deposits' (Freire retrieved from Kolb, 2015, p. 38).

This banking concept of education means that as teachers we simply provide the information and expect students to simply listen, memorize, and repeat. Beyond those expectations, students are not expected to use this knowledge in a real and authentic way and apply it to real-life situations. The philosophy of the banking concept of education that we currently hold holds no expectation for our students other than to listen and regurgitate information without connecting to prior experiences.

The constructivist approach, however, argues that this "banking" approach to education is lacking in many ways. In fact, they argue that the banking concept is lacking the "human" concept. Constructivists argue that learning is not a transaction between the student and the teacher but rather "learning involves transactions between the [student] and the environment" (Kolb, 2015, p. 45). When looking at a constructivist approach to teaching it is essential to realize that

> Children come to school with a multitude and a great variety of experiences and adventures acquired from this natural inquisitiveness and their innate desire to find out why things happen and how things work...When teachers give their students encouragement, sensitivity,

> and developmentally appropriate teaching; the power to ask and investigate their own questions; and ownership of their own constructions, this curiosity and desire to explore continues through the elementary grades and even into adulthood (Martin, 2009, p. 3).

It is imperative to provide students with opportunities to make meaningful connections to their learning and connecting their current learning to past experiences. By doing so, students will be capable of greater understanding in their learning. Martin (2009) frequently expresses the importance of fostering students' curiosity, particularly in the early grades. When students begin to lose their curiosity, their interest in school-related projects and information will slowly start to decline.

We can connect this to the research conducted by Jean Piaget. Piaget conducted a wide-variety of research on the reasoning processes of young children that can be correlated directly with theories of experiential education. Piaget was interested in the reasoning children used to arrive at answers. He discovered that "younger children were not 'dumber' than older children; they merely thought about things in an entirely different way" (Kolb, 2015, p. 12). When thinking about this theory through the lens of experiential education it demonstrates the different ways that children approach their learning. The "banking" approach to education states that as teachers we deposit the learning into the students' minds. However, Piaget's research tells us that our students think and generate knowledge in an entirely different way than an adult would. It is arguable then that we must allow students to engage in learning that is at their developmental level.

While reading and mathematics have become the major focus as a result of NCLB, it is important to recognize that other subjects are no less important to the learning occurring in the classroom. Martin (2009) claims "the emphasis on high-stakes testing has had the effect of discouraging teachers from taking the time to foster children's explorations into scientific investigations"(p. xvii). However, there are associations working diligently to foster science education. The National Research Council (NRC), the National Science Teachers Association, the American Association for the Advancement of Science, and Achieve have worked together to design the Next Generation Science Standards for grades K-12. These science standards identify "content and science and engineering practices that all students should learn" (NGSS, Implementation, n.d.). States are currently in the process of adopting these standards as their own and providing teachers with a guide for science education.

These standards appear to support the constructivist learning approach. Most importantly, Next Generation Science Standards focus on students learning science by *doing* science. The projects suggested in the standards are hands-on, inquiry-based projects that allow students to explore "answers to their questions by applying the processes of science in [an] open-ended" (Martin, 2009, p. xv) manner. Through the creation of these standards, we can see a shift occurring in the pedagogical approach to education.

Case Studies

We can see the success of these learning techniques, not only through the success of the Chicago Laboratory School but also in studies that have been

conducted recently To begin, Heather Thiry, Sandra L. Laursen and Anne-Barrie Hunter (2011) detailed their research into the use of hands-on learning for undergraduates studying science, technology, engineering, and mathematics. These authors suggested, "activities such as research and internship provide the opportunity to learn through engaging in authentic tasks within a social context" (p.361). In other words, providing students with authentic experiences in their field of study better prepares them for the jobs and careers they will posses in the future. These opportunities for learning are similar to those displayed at the Laboratory School, simply staged at a more advanced level for undergraduates.

This study took place at "four highly selective liberal arts colleges" (p. 362), interviewing 76 rising seniors and their 55 faculty advisors. After the initial interviews, the seniors and their advisors were interviewed twice more: once before graduation and again 2 to 3 years after graduating. These interviews were taped and transcribed before being processed through a computer software program. This software program analyzed text fragments from the interviews and categorized them into "six domains of benefits" (p. 363). These six domains included: thinking and working like a scientist, becoming a professional, personal and professional gains, career clarification, enhanced career preparation, and skills.

Overall the "student's comments about participation in their curricular and co-curricular activities were positive" (p. 367). Participants described that their participation in these internships and other activities were helpful in preparing them for scientific work and the future employment they would pursue after completing their education.

While this study occurs at the collegiate level, the data collected and analyzed from the interviews supports that the students received valuable experience and learning opportunities through the internships and hands-on learning that occurred. In general, the students stated in the interviews the time spent in the co-curricular activities were positive and allowed them to be better prepared for scientific work and future employment. I believe these same types of experiences can occur at the elementary level as well, as are evident in Dewey's Laboratory School.

There are however, many educators who continue to propose that direct instruction is the best method to use in the classrooms today. This is the preferred method for teaching in many classrooms and many educators believe we should continue with this method. This belief is supported by several studies, such as Klahr & Nigam (2004). This study involved 112 third and fourth grade students in a study to measure

> the relative effectiveness of discovery learning and direct instruction at two points in the learning process: (a) during the initial acquisition of the basic cognitive objective (a procedure for designing and interpreting simple, unconfounded experiments) and (b) during the subsequent transfer and application of this basic skill to more diffuse and authentic reasoning associated with the evaluation of science fair posters (para. 1)

The question Klahr and Nigam (2004) sought to answer was whether or not discovery learning or direct instruction was more effective in teaching science concepts to elementary-age students. Klahr and Nigam (2004) found that direct

instruction resulted in more "masters" of the subject than discovery learning. The statistics presented in this study certainly cannot be argued. In this study the concept of direct instruction was more successful than discovery learning. However I feel that there is a problem with their approach to the discovery learning aspect.

Klahr and Nigam (2004) state that "there was no teacher intervention beyond the suggestion of a learning objective, there were no guiding questions and no feedback about the quality of the child's selection of materials, explorations, or self-assessments" (para. 5) in the discovery learning condition. They admit that they intentionally magnified the difference between the two instructional approaches. However I would argue that this distorts the results received in the study. When we look at Dewey's Laboratory School it is clear that the students guided the learning done in the classroom. However, the teachers in the Dewey school still played an active role in guiding student learning. In no way were the students left to their own abilities while the teacher observed with no input. The job of the teacher was to be an active guide for the students, allowing them to learn from their own experiences rather than lecturing from the front of the classroom.

It is this lack of instructor-led teaching and instruction that leads me to believe this study has some methodological flaws. Surely the study has some value in showing the learning of students occurring through direct instruction. Unfortunately, it appears that Klahr and Nigam (2004) have distorted the true meaning of discovery learning within their study so that the results of that condition must be questioned. Klahr & Nigam (2004) admittedly magnified the direct instruction condition, however the magnification did not cause them to deviate form

the true nature of direct instruction. In comparison, the distortion of the discovery learning technique created an essentially biased representation of discovery learning.

Several other studies have been designed around the findings of Klahr and Nigam (2004) but with several important differences. Lazonder and Wiskerke-Drost (2014) sought to analyze the effects of both direct instruction and task structuring in advancing the scientific reasoning of students at the upper elementary level. The major difference between this study and the study led by Klahr and Nigam (2004) was the acceptance that discovery learning in not unguided inquiry. The ultimate findings of the Lazonder & Wiskerke-Drost (2014) study was that "direct instruction and task structuring are equally effective and superior to unguided inquiry...consistent with a vast body of evidence showing that guidance is a key to successful inquiry learning" (2014, p. 75). What Lazonder & Wiskerke-Drost (2014) ultimately state is without any guiding or instruction we cannot expect our students to learn and succeed. Dewey's argument was not to allow students to engage in discovery learning with no guidance from adults and teachers. Students at the Dewey Laboratory School engage in authentic discovery learning activities that were guided, supported and encouraged by their teachers and other masters of learning such as professors or masters of a trade. While this study by Lazonder and Wiskerke-Drost (2014) finds discovery learning and direct instruction to be equally effective, it more importantly states that students must be guided through their learning in some way because unguided inquiry is an ineffective method of teaching.

In another study conducted by Cobern, et. al. (2010) the use of inquiry and

direct instruction was again analyzed for effectiveness in the field of science education. In this study the goal was to analyze "whether an inquiry approach or a direct approach to experientially-based instruction is more effective for science concept development, when both approaches are expertly a designed and well executed" (2010, p.2). The expertly designed and well executed focus was an important facet of this study and one reason why I believe the results from this study can be considered more reliable and valid to the research accumulated on this topic. For these researchers it was essential that both approaches were designed and taught to the best of their ability and taught with fidelity.

In the conclusion section of this study, the researchers make an excellent point regarding the comparison of direct and inquiry based instruction.

> Most science educators feel that Inquiry Instruction, by its very nature, provides crucial added value, in having students 'do' science for themselves. For Direct Instruction, given our findings that it does not lead to a better grasp of the basics, it is not as clear what other grounds there might be on which to argue superiority. It may be easier or less time consuming for the teacher, or less demanding for weaker students, at least initially. However, direct instruction risks sending the message that science is simply a body of knowledge to be learned (Cobern et.al, 2010, p. 5)

In their study Cobern et. al (2010) find that direct instruction and inquiry based instruction are equally comparable. However, they argue that with no proof that direct instruction is innately better than inquiry-based instruction we must, as

teacher be willing to do both. In fact, they find no reason why a teacher should not embrace inquiry-based instruction when teaching science.

It is also evident that educators in higher education are beginning to acknowledge "learning is no longer 'for kids' but a central lifelong task essential for personal development and career success" (Kolb, 2015, p. 3). This acceptance of lifelong learning can be seen in the increased use of "internships, field placements, word/study assignments, structured exercises and role plays, gaming simulations, and other forms of experience-based education" (p.3). Universities are becoming increasingly accepting of these experiences and are, in fact, beginning to encourage and reward students who chose to take part in these experiences. For example,

> A study by the America College Testing Program (1982) shows that credit given in colleges and universities for prior learning experience has grown steadily since 1973-74 to 1980-82. In 1980-82, 1 1/4 million quarter credit hours were awarded for prior learning experience (Kolb, 2015, p.3)

This increased acceptance demonstrates that lifelong learning is being increasingly recognized in the world of higher education. What we must begin to analyze, and perhaps accept, is the importance of increasing these experiences in the lower levels of education as well as high education.

21st Century Implications

When comparing Dewey's Laboratory School and modern elementary classrooms, it is clear several differences must be taken into consideration. These differences included school facilities, available time, resources, and the focus on

common core standards. .

First and foremost, the facilities used by the Laboratory School were extensive and designed to specifically support the pedagogical approach of the school. In the Laboratory School students had the space to conduct science experiments, build furniture and other projects, engage in cooking exercises and explore the expansive grounds of the University of Chicago. The University itself was another valuable asset. Many of the professors at the University frequently visited the Laboratory School and assisted in educating and guiding the young students through exercises in their different fields. These assets provided a major influence in the teaching at the Laboratory School.

It was clear these facilities and assets would not be available to me in the modern day classroom throughout my research. Instead I would need to bring the spirit and ideals of experiential education into the 21st century classroom. This thesis studies the impact experiential education has on the content knowledge and the affects students have regarding science. Additionally, it will examine the feasibility of incorporating experiential education in a modern classroom. It will be compromised of a small science unit on insects, focusing specifically on insect life cycles, with emphasis on creating authentic learning experiences that allow students to engage in different aspects of the scientific process. While this research will not hold the same process or activities that students engaged in at the Laboratory School, it will have the same goals of scientific and personal inquiry and authentic experience. The next section will introduce and explain the methodology I have selected to explore this problem of practice.

Methods

Introduction

The purpose of this research study was to analyze the effectiveness of experiential education in science education and determine if the pedagogical approach can be implemented in the modern classroom. The study sought to analyze how students' attitude towards science changed after receiving science education through hands-on, authentic learning experiences. I chose science as the subject of focus because students receive limited science instruction in their day-to-day curriculum.

Research Methods

For this research study I chose to conduct a mixed methods research study and collect both a quantitative and qualitative data. Qualitative research is chosen when "the setting of the study influences what will be learned" (Clark & Creswell, 2010, p. 75). Throughout this research study, I was influencing and manipulating the setting in which the students' learning occurred. This manipulation of the setting was a major factor in my choice to conduct qualitative research. Additionally, my purpose was to explore the participants' attitudes and prior experiences with science education. Seidman (2013) claims, "at the root of in-depth interviewing is an interest in understanding the lived experience of other people and the meaning they make of that experience" (2013, p. 9). Understanding the prior experiences and meaning developed from that experience was essential in determining the effect of experiential education on the student's attitudes toward science education. Based

on this information I chose to conduct interviews to develop this understanding of my students.

In addition to the qualitative research, I felt quantitative data was required to best support any claims I may be able to draw from this research. Clark and Creswell (2010) state quantitative research is used when " the issue or problem being examined needs to be studied to determine what factors influence an outcome..." (2010, p. 75). In this research study I collected quantitative data for the purpose of comparing the pre- and post-assessment scores to determine if there was a trend in the data that portrayed an increase in student's content knowledge. My main purpose for this was to determine if a hands-on, authentic learning experience provided students with the required content knowledge.

To complete and receive licensure through the Western Oregon University College of Education a student must successfully complete two Teacher Work Samples throughout the three terms of co-teaching in the classroom environment. The Teacher Work Samples include setting, unit plan rationale, a set of standards and appropriately written objectives, pre- and post-assessment tool, pre- and post-assessment analysis, 10 complete lesson plans, and an overall reflection.

During my first Teacher Work Sample I implemented my research study in a first grade classroom. In addition to the features of the traditional Teacher Work Sample I included two sets of student interviews. These interviews were recorded and transcribed in order to include information from the interviews in the analysis of the research study. According to Siedman (2013) "a basic assumption in in-depth interviewing research is that the meaning people make of their experience affect the

way they carry out that experience" (Seidman, 2013, p. 18). The purpose of this research study was to determine if experiential education was possible in a modern classroom and to analyze its effectiveness in changing the experiences and attitudes of the research participants. The interviews were used to gather information regarding the previous experiences students held regarding science instruction and education and examine whether or not these attitudes and experiences change upon completion of the study. If I were to just collect quantitative data for this research study, I would not have developed a relationship and deeper understanding of my students and their experiences in the field of science. It was this understanding that allowed me to collect and more accurately analyze the data in regards to their prior experiences with the content.

Participants

The research for this study was conducted in an elementary school in the Pacific Northwest. The school district is small in comparison to other districts in the surrounding areas, containing only three elementary schools, one middle school, and one high school with a total of 3, 246 students in 2015 (ODE, Student Enrollment Comparison, n.d.). In the 2014-2015 school year 49.7% of the students in this district were eligible for free or reduced lunch (ODE, Free & Reduced Lunch, n.d.) raising concerns regarding the socioeconomic status of families. In addition, the school site accepts funds for Title 1 programs. Title 1 is a program that "provides financial assistance to local educational agencies (LEAs) and schools with high numbers or high percentages of children from low-income families to ensure that all children meet challenging state academic standards" (Improving Basic Programs,

n.d.) In other words, these Title 1 funds allow students to receive additional assistance if they are considered "at-risk" or failing.

The participants for this study included 25 students in my first grade classroom. I was fortunate to have a clinical teacher who allowed me to use her classroom to conduct my research and test my educational theories while completing my student teaching. Prior to administering my research I spent four months working with and developing relationships with my students. Of the 25 students in this class, 15 students are male and 10 are female. The majority of the students are Caucasian with only one African American student.

In addition to myself I had the help of my mentor teacher and one Instructional Assistant (IA) at all times. When using my mentor teacher or the IA's during the lessons it was imperative to deliver explicit instructions to ensure the activities were completed as planned.

Procedures

Typically qualitative research sampling is done through purposeful sampling, or the intentional selection of "sites and individuals to learn about or understand the central phenomenon" (Clark & Creswell, 2010, p, 253). However, the participants in this research study were not selected through purposeful sampling, but rather a nonprobability sampling. As a researcher I was not permitted to select students or a school intentionally, but rather studied the students present in the classroom in which I was completing my student teaching because they were "available, convenient, and represent[ed] [a] characteristic" (p. 184) I wanted to study. Additionally, only a few students were selected for interviews because my

ability to "provide an in-depth pictures diminish[ed] with the addition of each new individual" (p. 255). One additional reason for using nonprobability sampling in my study was the requirement of parental consent for students to participate in the interview process. While there were several reasons the nonprobability sampling was used in my study, it is important to also acknowledge the downfalls that are presented as a result. While using nonprobability sampling is easier than "probability sampling, its use limits the conclusions the researcher can make about the results" (p. 184). These limited conclusions are a result of the lack of generality. For example, this type of sample does not allow me to say that these results would be generally expected in all first grade science classes when using the Deweyan teaching theory because the participants in the study do not represent a general population. However, I used this type of sampling not only because the participants were available and convenient, but also because I was interested in "describing the differences in, or relationships between, variables for a small group of participants" (p. 184).

My first step was to send home parent request forms to receive parental permission to interview a small subset of students for the research study. I received only five returned forms granting permission to interview the students. As a result, I did not have a large pool of students with permission to make further selection from. Instead, these five students were the students who participated. It happened to work in my favor that the small group represented in the study was fairly balanced in relation to gender. I conducted the first interview with each of the five students prior to delivering the pre-assessment. Each interview was conducted

separately. I explained the reason and purpose for the interviews to the students and read through a student-friendly permission form with the students. Once students themselves agreed to participate in the interview and to be recorded, I conducted the interview.

Once I had received the parental permission slips I was able to set-up an action plan and timeline in order to ensure that I received all the information necessary from my students. The following is the action plan I used:

1. Conduct student interviews
2. Administer the pre-assessment
3. Teach the science unit
4. Administer the post- assessment
5. Conduct the second set of student interviews.
6. Deliver a one-month post-assessment

Instruments & Measures

The measures for this study included two assessments (a pre- and a post-assessment) as well as two interviews (pre- and post-interviews). The pre- and post-assessments provided data and information regarding the knowledge and understanding students possessed regarding content information. All students participated in the pre- and post-assessments.

The pre and post interviews were a series of five questions (Appendix B) conducted on an individual basis before the pre-assessment and after the post-assessment. The goal of the interviews was to discuss students' feelings regarding science, examine how much experience they might have with the subject area, and

to gain an understanding of students' opinions towards science in general. In general, this interview was used to gauge whether students opinions and feelings toward science changed over the course of the science unit. Because all of the participants were first graders and therefore not legally able to give consent, I created, distributed, and collected a parent consent form (Appendix C).

After collecting the parent consent forms I pulled the five student participants aside individually and explained the interview process and purpose. I used a student-friendly consent form (Appendix C) and obtained permission from the students to continue on with the interview process. The interviews were conducted individually and separate from the classroom during a time of the day in which no other students would notice the others absence and make any assumptions that could have caused emotional distress for the student. In first grade students are still learning to read and cannot yet read fluently. During the interviews I personally read the questions aloud to them eliminate confusion from inability to read the questions. If necessary I simplified or restated a question to help the students better understand the question. These questions were simple and allowed students to reflect on (1) their prior experiences (good and bad) in science, (2) their feelings toward the subject area, and (3) their opinion of their abilities in the subject area (i.e. whether they thought they were good at science or not). The interviews were recorded and later transcribed for the purpose of this study (see Interview Transcriptions). To protect the identities of the participants in this study, random numbers have been assigned in place of the participants' names.

Pre-Assessment

When creating the pre-assessment (Appendix B) I aligned my pre-assessment directly to the goals and objectives written for this unit of study. The questions on the pre-assessment aligned directly to the objectives written and used for this science unit. This alignment ensured that the data I collected from the students prior to the beginning of the unit provided me with accurate information regarding their knowledge and skills in relation to the unit objectives.

The pre-assessment targeted assessment of content knowledge in science and mathematics, as well as students' ability to determine the difference between fact and opinion. The pre-assessment covered this range of topics because all topics were covered throughout the science unit in an effort to show how science reaches across different content areas. Throughout the pre-assessment I utilized different images to assist in gathering information and to provide students with a visual for the different questions. These images also helped to make the test appear non-threatening, particularly for the young age group.

Prior to administering the pre-assessment I made sure to have my mentor teacher look over the finished product and provide me with any suggestions or adjustments. Most of the adjustments and suggestions focused around rephrasing the wording of different questions or changing a fact or two in some paragraphs. This feedback allowed me to adjust the pre-assessment to help collect more accurate information from my students.

When I created the points for the pre-assessment, I looked over each question individually and decided on point values for the individual questions. As a result, some of the questions were weighted more heavily than others based on the

requirements of the individual questions. On the pre-assessment I labeled the point values for each individual question in quotations at the end of the question.

The pre-assessment was delivered in two small increments due to time constraints during the schedule of the day. The initial section was delivered from 12:00-12:30 with the second portion being completed between 1:00-1:15. Due to the age and reading ability of the students, every question was read aloud to the students during the pre-assessment. This was to ensure that the assessment was not assessing students' ability to correctly read the question but was assessing their content knowledge.

During the pre-assessment the class was divided into four small groups to complete the assessment. Each group had a teacher or instructional assistant administering the pre-assessment to the students. The pre-assessment was delivered in small groups to allow individual students the time they required to thoroughly answer the questions. Each teacher and instructional assistant was explicitly instructed to read only the questions as they were written and to not assist the students in answering the questions.

Post-Assessment

The post-assessment (Appendix B) was changed from the pre-assessment in only a few minor ways. On questions #1 and #8 I changed the unit of measurement from non-standard (Unifix cubes) to a standard unit of measurement (inches). When analyzing the results of the pre-assessment, I discovered that students were exceling at measurement with non-standard units and chose to push them further during the science unit. As a result, students were asked to use a ruler and measure

in inches on the post-assessment. In addition, I made some changes to the wording on question #7 in an effort to provide more clarity.

Role of the Researcher

As stated before, I spent approximately four months in the classroom where I conducted my research, prior to the beginning of my research study. As a result I had gathered a significant amount of data in regards to my students from my observations of them during this time. Prior to conducting the student interviews I was aware of the limited experience my students had in their science education due to the lack of time spent on science in our classroom.

The amount of time spent in this classroom created a personal bias on my part as a researcher because I instinctively wanted my students to succeed in this research study. However, while conducting the research I took a very methodical approach to suspend the bias I had developed by spending time with the students. The designed interview questions allowed me to remove my bias because I simply read the questions aloud to the students and recorded their responses. Additionally, the audio recordings allowed me to provide direct transcriptions accurately and remove bias from the data because I had the physical evidence of students' responses.

Data Collection and Analysis

The quantitative data was collected from the pre- and post-assessments taken by the students at the beginning and end of the science unit. Each assessment was scored according to an assessment key to remove researcher bias and the students were given a percentage score. This percentage was based calculated as

follows:

(# of Points Correct/Total Points possible) x 100= Percentage received

These percentages were then compared using a graph to see the learning increase between the pre- and post-assessments (see graph in Findings). Additionally, the data was calculated to an average for class, average for the subgroup, and an average for the individual. This comparison allowed me to analyze the data from pre- and post-assessment from each student individually as well as the class as a whole.

The qualitative data was collected through student interviews were audio recorded and later transcribed (transcription in Appendix B) for analysis. When examining the interview responses I first looked for understanding of the question. For example, at least two of my participants responded by not answering the questions, even after prompting, or responded by only discussing science as "blowing bubbles." I found these interview responses to be lacking in meaningful data due to either the lack of response or the focus on an unrelated topic to the interview. After analyzing the students understanding of the questions I began to analyze their responses and examine the prior experiences my participants had with science education. This analysis did not provide quantitative data but was focused more on the meaning and understanding developed by my students from these experiences and what this understanding meant in the scope of my research study. The lack of experiences factored greatly into the data I was able to collect and analyze between the pre- and post-interviews in regards to my students' attitudes and experiences with science.

Findings

Introduction

The purpose of this research study was to analyze the effectiveness of experiential education in science education and determine if the pedagogical approach can be implemented in the modern classroom. The study sought to analyze how students' attitude towards science changed after receiving science education through hands-on, authentic learning experiences.

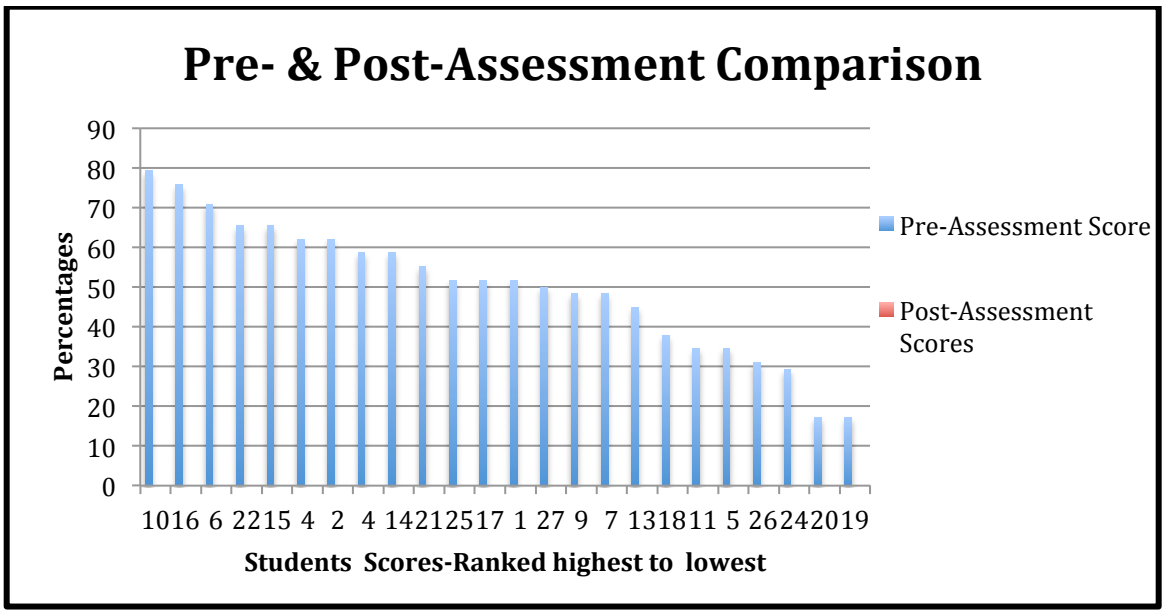
Analysis of Data

The pre-assessment results demonstrated to me that the students lacked prior knowledge or experience with science or the particular subject matter. The class average on the pre-assessment was 50.1%. Some students scored relatively high on the pre-assessment, demonstrating that the planned activities would help to reinforce the information they already knew as well as to challenge them further and present them with real-life application and authentic learning experiences.

What interested me was ensuring I targeted the students who scored lower on the pre-assessment. The low scores (50% and below) demonstrated these students had little to no prior knowledge with the subject material. These results indicated it was essential to spend some time during the unit providing the students with the foundational knowledge necessary to complete the planned activities.

Presentation of Results

Graph 1.1 Assessment data on pre-assessment scores from highest to lowest.



The gains from the pre-assessment to the post-assessment were significant. The average learning gain for the class was 24.9%, with several students gaining significantly more than the average gain. Out of the 25 students in my class, only two students showed a negative learning gain after the completion of the science unit. My clinical teacher and I discussed the possibility these students were able to "guess" the correct answers on the pre-assessment, but did not actually posses the knowledge their scores originally portrayed, therefore providing me with inaccurate data for the student. In general, I was pleasantly surprised that 24% of my students showed an increase of 30% or higher learning gain.

When computing the scores and averages, three students were removed from the calculations because they had not completed the post-assessment. These students were unable to complete the post-assessment due to chronic absence or being pulled-out for interventions every day. I did not want scores of zero to negatively impact the overall percentages or averages and I therefore choose to

remove them from the overall calculations. I have broken down the percentage assessment gains in the table below:

Table 1.1 Pre-Assessment and Post-Assessment Gains

% Increase	0-9%	10-19%	20-29%	30-39%	40-49%	50-59%	Negative	Exempt
# of Students	1	3	9	3	2	1	2	4

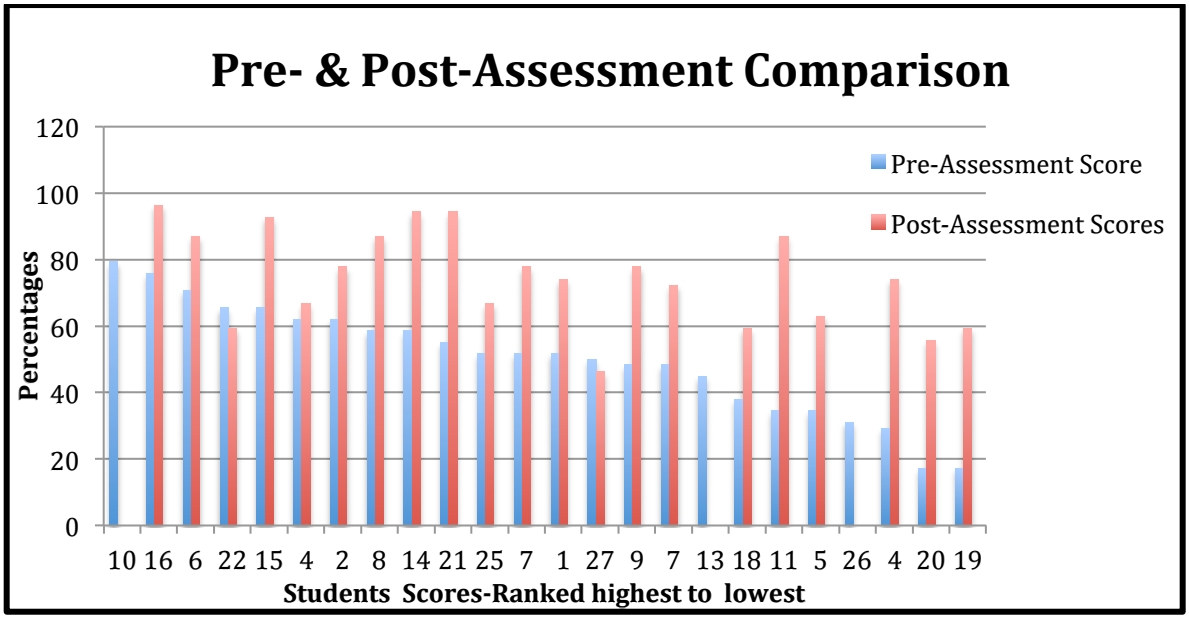
The scores of the individuals and their learning gains can be seen in greater detail in the tables and graphs below.

Table 1.2 Assessment data based on pre-assessment scores from highest to lowest.

Pre-Assessment Test Scores		Post-Assessment Test Scores	
Student	Pre-Assessment %	Post-Assessment %	Learning Gains
10	79.3%	-	-
16	75.8%	96.3%	20.5%
6	70.7%	87%	16.3%
22	65.5%	59.3%	-6.2%
15	65.5%	92.6%	27.1%
4	62.1%	66.7%	4.6%
2	62.1%	77.8%	15.7%
8	58.6%	87%	28.4%
14	58.6%	94.4%	35.8%
21	55.2%	94.4%	39.2%
25	51.7%	66.7%	15%
17	51.7%	77.8%	26.1%
1	51.7%	74.1%	22.4%
27	50.0%	46.3%	-3.7%
9	48.3%	77.8%	29.5%
7	48.3%	72.2%	23.9%
13	44.8%	-	-
18	37.9%	59.3%	21.4%
11	34.5%	87%	52.5%
5	34.5%	63%	28.5%
26	31.0%	-	-
24	29.3%	74.1%	44.8%
20	17.2%	55.6%	38.4%
19	17.2%	59.3%	42.1%

Class Average	50.1%	74.7%	24.9%

Graph 1.2: Comparative Assessment Data



Interpretation of Findings

The student interviews allowed me to collect personal information from students regarding their experiences with science as well as their feelings regarding the subject matter. My initial goal was to interview a small selection of students with different achievement levels in other subject areas to get a wider data pool. However, I received only five returned permission slips from the parents, which greatly narrowed my selection pool. As a result I simply interviewed the five students whose permission slips I had received and transcribed these interviews.

Interview Findings-Student #5 (female)

Throughout the first interview it became clear that #5 was not familiar with the subject of science and had spent very little amount of time engaging in scientific activities inside or outside of the classroom. During the first interview, the students associated science with "bubbles" and continued with this idea throughout the entire interview, despite my efforts to discuss any other aspects of the subject. Despite this lack of general knowledge regarding the content area, student #5 responded with a resounding "Yes!" when asked the question, "Do you think you are good at science?"

After the completion of the study student #5's answers did not change very much. The student still responded with answers regarding "blowing bubbles" as science even when prompted to provide other examples. I found this lack of change interesting because the students had a 28. 5% learning increase between the pre-assessment and post-assessment. On the positive side, the student continued to have positive opinion regarding her abilities in science.

Interview Findings-Student #10 (male)

Student #10 has shown dedication to his work throughout the year and an eagerness to learn new material. Throughout the year I had read several science books with him during independent reading time and was interested to learn more about his prior experiences with science. While discussing some of the experiments he had done, I discovered that the student had participated in the Kids in Science after school activity program for a short amount of time. The student and I discussed several different science experiments he had done and the positive experiences he had. I received the general understanding that the student enjoyed

doing science when he was presented with the opportunity.

Unfortunately the student was removed from the school for a three-week period during the science unit due to a family emergency and therefore received little to no instruction during this unit. As a result, his data was removed from the post-assessment and I was unable to conduct a second interview with him.

Interview Findings-Student #12 (female)

Throughout the first interview with Student #12, I received very little information regarding her experiences or feelings regarding science. In the transcriptions it is evident that the student frequently did not respond to the questions, even when rephrased, or responded by stating "I don't know". This student responded to questions regarding her experience and abilities in science by stating that she did not believe she was good at science "because I have never done it before" and that "nobody helps you" when doing scientific activities. These statements only increased my determination to make the science unit a positive learning experience for these students because I felt many of them had little to no experience with science, similar to this student.

During my second interview with student #12, I received more answers in response to my questions, but the student provided very little detail with the answers. I was pleasantly surprised the student's opinion of her abilities in science had changed over the course of the unit and she now felt she was "good at science."

Interview Findings-Students #17 (male)

My interview with student #17 was relatively short due to his lack of

experience in the content area. He felt he wasn't able to answer the questions being asked due to his lack of experience. This did not surprise me, because the questions he was unable to answer required him to reflect on particular experiences in science. Without these experiences he was unable to answer the questions. I was pleasantly surprised to hear, despite his lack of experience with science, he felt it was important to learn science "because you get to learn stuff you don't know". Despite this insight into the reasons for learning, student #17 did not feel that he was good at science, mostly due to a lack of experience with the subject.

During the post-unit interview I marveled at the change in student #17's change in attitude towards science. Once the student had experiences to draw upon, I found he had much to say regarding his experiences and opinions regarding the subject. He continued to believe science was important to learn and he enjoyed the opportunities to learn new and different things. In fact, when asked what he disliked about science he responded by stating "umm...nothing!" It was not surprise when student #17 stated that he felt he was good at science. Student #17 also stated the science unit had made him more interested in science "because [he] got to learn different things [he] didn't know about bugs and insects." This positive increase can also be seen in the results from his pre- and post-assessments. Between the pre-assessment and post-assessment student #17 showed a 26.1% learning gain.

Interview Findings-Student #25 (male)

When interviewing student #25 I was wonderfully surprised by his insightfulness, connections, and overall willingness to talk. Typically, student #25 is quiet and shy while in class and frequently must be prompted to talk or participate.

Immediately the student claimed science was important to learn "because it helps with math, “a connection I was hoping students would make by the end of the science unit. Throughout his interview the student repeatedly expressed his desire to "be smart" and to "make his brain smart." I was heartened by this student's eagerness to learn, despite his lack of experience in science. It was clear the student had little to no experience doing science personally but had experienced science through books or television shows.

The post-unit interview was similar to the initial interview with Student #25. He continued to feel that it was important to learn science in order to help with learning other subject material. One change I was happy to hear was student #25 began to see science as an interesting or entertaining activity. He explained "science is sometimes fun and stuff...you get to make stuff and do other things...and do really, really fun things if you do science." It was wonderful to hear this student make the connection of science being an interesting activity. One of my hopes throughout this study was to develop a sense of greater interest in science within these students. Student #25 demonstrated he now looked at science differently as a result of the unit. This student was also very eager to share his new knowledge regarding insects during the interview and I was thrilled to hear how much information he had retained throughout the unit.

General Themes & Ideas about Science from Student Interviews

One general theme that became apparent to me from the student interviews was the students' lack of prior experiences or background knowledge in the field of science. Almost all of the participants in this study had never participated in science

education or scientific experiments and therefore found it difficult to answer questions regarding their feelings and prior experiences with this content area. In general this feeling changed after the completion of the science unit once the students had been exposed to scientific content knowledge.

Additionally, students felt more confident in their abilities to do science after the completion of the science unit. When asked, "Do you believe you are good at science?" almost all students responded affirmatively in the post-interview. While I believe this response was partially due to students being provided with exposure and experience in the content area, it is also important to note all students responded positively regarding their abilities in science during the post-interview. Regardless of why students answered affirmatively, the very fact that they now believed themselves to be good at science demonstrated to me this science teaching was effective in providing a positive affect towards science education.

The interview with Student #10 stands out as an outlier to me in the ways he differed from the other students interviewed. Unfortunately this student was removed from school for three weeks during the instruction and was removed from the study due to his lack of received instruction. Despite this, I felt that student #10 experiences provided him with a different background and perspective of science education. During the interview, it became clear to me student #10 had more experience with science in comparison to the other students interviewed. I believe that student #10 would have provided a different perspective during the post-interviews compared to the other students had he received the instruction and continued with the post-interview.

Study Limitations

It is important to note that while I strived to create a true Deweyan framework of teaching and learning throughout this science unit, it was not possible to model the entire unit in a 100% experiential learning set-up due to limitations of the school curriculum, time, and availability of materials. In particular, two significant factors throughout this study were the school curriculum and the availability of time to work with the students. The next section will explain the influence of these factors.

Time was the major limitation for myself and the students throughout this study. During this study I was still taking classes at the University as well as teaching in the classroom. As a result I was only able to be present in the classroom Monday, Tuesday, and Thursdays. I received only one week during the term in which I was present for the entire week to teach my science unit. This played a major role in the framework I was able to develop. If I had been in the classroom everyday of every week I feel that I would have been able to create more accurate representation of the Deweyan Framework of learning and teaching.

In addition to the time constraints during the lessons, I experienced some difficulties with the incorporation of the true Deweyan model into the lessons. Typically, when studying different topics at the Dewey Laboratory School these topics were infused into all aspects of the learning during the day (Tanner, 1997). The school I was working at had adopted curriculum that needed to be used when instructing in math, reading, and writing. As a result, it was difficult to infuse authentic, Deweyan learning experiences into every aspect of the students' day and

learning.

Another limitation of the study was the different time the post-assessment was administered in comparison to the pre-assessment. This time change contributed to several different test-taking factors for the post-assessment that students did not face in the pre-assessment. Due to time constraints in the afternoon, my teacher requested that we move the assessment to the morning during intervention time. The post-assessment was delivered from 10:30-11:00 AM and was delivered whole class. I had only one Instructional Assistant during this time. I pulled five students to her table who typically required some additional time when answering the questions, but otherwise read aloud the instruction for the post-assessment to the whole class. I had four students who were pulled out of the classroom for intervention during this time. For these students I delivered the post-assessment as a small group on a different day. I would have preferred to deliver the post-assessment under the same conditions as the pre-assessment, however time and availability of instructional aides played a major role in the administration of the post-assessment.

I also was unable to administer the additional post-assessment one-month after the original post-assessment due to lack of time in the school day. The purpose of additional post-assessment was to examine if the information learned throughout this science unit was retained over time. Unfortunately, there was not an adequate amount of time to complete and additional post-assessment one month after the first post-assessment. As a result, I am not able to analyze or comment on the rate of retention in students when using this particular teaching method.

Conclusion

Introduction

This study examined the effects of experiential education teaching on students' affect and depth of knowledge in an academic curriculum as well as the possibility of experiential education inclusion in a 21st century classroom. Examination of the possibility of inclusion in a 21st century classroom was not the main focus of the study; however, I felt it was important to examine the effectiveness of this type of teaching in a modern classroom setting.

Synthesis of Findings

When I reflected on the overall findings regarding student knowledge, I did not feel that the findings demonstrated an immensely large gain of knowledge. When looking at the average knowledge gain between the pre-assessment and post-assessment, it appears that the gain was not significant enough to conclude the results were due to the type of instruction. It was clear from the beginning of the unit and the pre-assessment data my students had little to no prior experience or knowledge with this content area. I believe their knowledge gain from the pre-assessment to the post-assessment was a result of experiencing instruction within the content and not the specific form of instruction.

While I cannot provide any definitive data to state the increase in knowledge was a direct result of experiential education opportunities, I do have themes I have drawn from the data. Throughout the science unit, student engagement levels were high. I felt that students were actively interested in the material not only during science time, but throughout the school day. Student engagement was highest when

students were involved in authentic learning experiences. For example, when students conducted the playground bug safari/hunt the level of engagement was high and I was able to witness the amount of knowledge the students had absorbed in the classroom being applied in authentic ways.

I hoped the interviews would provide me with detailed information regarding students' prior experience and knowledge regarding science as well as their affect and interest towards the content area. When reflecting back on the interviews (see page 109) conducted I did not feel that I received enough detailed information from the interviews to make any definitive conclusions.

I feel that this lack of information stemmed from two sources. The first source was the student's lack of experience (discussed further below). In general, it was clear that the students had little to no prior experience with science and, therefore, could not draw on any prior experiences during the interviews. Lack of experience played a major role in the amount of information I was able to collect from the students. Additionally, I believe the questions I asked the students did not collect the exact information I required. I believe that a different measurement of affect would provide more in-depth and useful information in regards to student affect for science.

In the post-interviews there were some changes to students having a more positive outlook and affect towards science and I was pleased by this change. However, I believe this change could be due to experience in the subject area and not as a sole result of the teaching structure.

Situated in a Larger Context

The Next Generation Science Standards (NGSS) are currently in the process of being adopted as the state-adopted science standards and expectations for students. Next Generation Science states it is now more important than ever teachers use and develop curricula for science that is based on science standards. The purpose of Next Generation Science is to provide students and teachers with

> Quality science education...based on standards that are rich in content and practice, with aligned curricula, pedagogy, assessment, and teacher preparation and development. It has been nearly 15 years since the National Research Council and the American Association for Advancement in Science produced the seminal documents on which most state standards are based. Since that time, major advances in science and our understanding of how students learn science have taken place and need to be reflected in state standards (NGSS)

When examining the NGSS standards it is evident that the standards are calling for students to engage in in-depth, hands on scientific exploration that allows them to develop their thinking and teaches them how to examine problems and find solutions through science. These concepts in NGSS connect with the Deweyan theory of teaching and learning through authentic, hands-on experiences that allow students to pose and answer questions and to form their own ideas about the way the world works.

This research study begins to provide support for these theories of a hands-on learning approach to science. The goal behind this research was to analyze the

effectiveness of experiential education in science education and determine if the pedagogical approach can be implemented in the modern classroom and sought to analyze how students' attitude towards science changed after receiving science education through hands-on, authentic learning experiences. Examining the learning that occurred and the students change in affect can begin to support the theories and ideas presented by NGSS as the country moves forward with adoption of current science standards

Weaknesses in the Study

One of the major struggles throughout this study was my student's lack of experience in the field of science. This lack of experience made it difficult for me to gather detailed information and data regarding their opinions and past experiences with science, good or bad. With hindsight, I feel I may have received more information had I focused on a subject area the students were more familiar with, such as mathematics or language development (reading and writing).

Science was not present in the every day curriculum in my first grade classroom, therefore it was difficult to find the time to "squeeze in" science. Because there was no allocated time for science during the day, we unfortunately had to remove or decrease the amount of time we spent teaching other subjects in order to incorporate the science lessons. While I think ultimately the teaching of science was beneficial, I believe that teaching science to students should not be at the detriment of other important subject areas. As a result of cutting back other subjects in order to teach science, the amount of time for each lesson was quite short. I received approximately 30-45 minutes for every science lesson. I felt that this was a very

short amount of time in which to create authentic, hands-on learning experiences while also providing my students with some sort of instruction. As a result, I feel that there were times when the lessons and student involvement lacked a true experiential approach due to time constraints.

Implications for Further Research

The students I was working with were fairly young, ranging in age from six to seven years old. If I were to continue this study further I would be interested in examining the differences between this young age and an older age group, such as fourth or fifth grade. I feel that students in the higher grades would have more experiences to draw on and therefore would be able to make more connections between their past experiences and their current learning.

As stated above, I believe that the questions used during the interview did not elicit the information I was seeking. If I were to reexamine this study I would change the questions used as well as add an additional form of measurement to measure student affect and student interest. This measurement would include a variety of different questions and ask them to rate their responses to these questions on a scale. I feel that with this form of measurement I would receive more reliable data in regards to student interest and affect in regards to the subject area.

I have seen firsthand the benefits to student engagement when utilizing authentic learning experiences through an experiential education lens. The data from the student interviews demonstrated that the students' perception of their abilities in science changed after experiencing authentic learning experiences in their science education. Additionally, the data from the pre- and post-assessment

showed that almost all students experienced an increase in content knowledge from the pre- and post-assessment. This data has demonstrated to me the benefits of authentic, hands-on learning experiences in the classroom, specifically in science education.

Appendix A

Lesson Plans used in this study

Lesson #1

Date of Lesson: May 4, 2015

<table>
<tr><td colspan="4">HEADING
Lesson Title/Description: Insect Structure & Scientific Observations</td></tr>
<tr><td colspan="2">Lesson # 1 of 10</td><td colspan="2">Time Allotted for this Lesson:~45 minutes</td></tr>
<tr><td colspan="2">GOALS:

<u>Goal 1</u>
1. LS.1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.</td><td colspan="2">OBJECTIVES:

<u>Objective 1.1</u>
Following a demonstration of scientific journal observations, students will individually make at least 3 observations, from the suggested checklist, of the live caterpillars/butterflies in their science journals.</td></tr>
<tr><td colspan="4">PRE-REQUISITE KNOWLEDGE OR SKILLS:
For this lesson students will need to access any prior knowledge regarding insects in general as well as the ability to form questions they have or anything they want to know about insects. Students will also need writing skills they have gained in the course of this year to make written observations.</td></tr>
<tr><td colspan="4">MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION:
• Large piece of chart paper
• Markers
• Buzz! A Book About Insects by Melvin Berger
• Scholastic News: Insect World Records
• 7 images of different insects
• Large insect diagram
• "Describe a Ladybug" worksheet
• "Label the Body Parts" worksheet
• Student Science Journals</td></tr>
<tr><td colspan="2">PROCEDURE: Teacher Does….</td><td colspan="2">Students Do….</td></tr>
<tr><td>Time</td><td>Anticipatory Set, Motivation or hook:
Gather students at the front carpet.

10 min
• Instruct students to line up in the 3 rows (they have been</td><td colspan="2">Anticipatory Set, Motivation or hook:
Students will gather on the carpet.

Students will Turn and Talk with their neighbors before sharing the information</td></tr>
</table>

	practicing this) KWL chart-Fill out the "K" and the "W" section of the chart • Turn and talk about what they know • Turn and talk about what they want to know • Can always add questions we have throughout the unit • We will finish what we learned at the end of the unit.	they already KNOW about insects. Students will turn and talk with their neighbor about questions they have or what they WANT to know about insects.	
20 min	**Teaching/Modeling:** **Students are still on the carpet** Read Chapter One of *Buzz! A Book about Insects.* Transition: While students are moving back to their tables have them start looking at an image on the projector. Explain that you will ask them for observations once they are back at their seats. Discuss what the students notice about the insect in the picture. Hand out different pictures to the different table. Ask students to work with their table groups to make observations about the insects in the photos they have. • Suggest looking for the things we read about in the book (Chapter One) Make a list of the things that	**Teaching/Modeling:** Students will listen to the book Students will move back to their seats while looking at the image on the projector. Turn and talk with their table groups. Provide their observations to the whole class. In table groups, students will examine their insect photos and make observations. They will look for similar body features to the insect we observed as a whole class as well as the information from the book we read. Provide observations.	

	the students say. Diagram of an insect with labeled body parts • Use the large Scholastic News Diagram "Good scientists look at pictures or real insects and make observations about the things they notice."		
5 min	**Group Application/ Guided Practice:** Bring out the caterpillars that the students will be observing through their metamorphosis. Explain that the students will be making observations of the caterpillars throughout the science unit. • Observations are not "It's cute" or "It's cool" • Have a few students provide examples of good observations. Guide students through making observations about the caterpillars and recording these observations in their science journals.	**Group Application/ Guided Practice:** Provide examples of "good" observations. Verbally make observations about the caterpillars. Students will also record 3 observations in their science journals.	
15 min	**Independent Application/ Independent Practice:** Have students help pass out the two worksheets that students will complete. While the students are working, walk around the room to answer questions and facilitate classroom management. Double check for	**Independent Application/Independent Practice:** Students will complete their observations in their science journals. Students will complete the two worksheets handed to them (Describe a ladybug & Label the Body Parts)	

	understanding on the assignment.		
5-7 min	**Closure/ Sharing:** "We learned a lot today about different types of insects and the way their bodies are put together. What are some of the things we learned today? The most important ones? We will decide if we should add them to our KWL chart" Have students offer the things they learned. Check with the whole class before adding these ideas to the KWL chart.	**Closure:** Students will reflect on the things they learned today. They will agree on adding the information to the chart when they think it is important.	

MEETING VARYING NEEDS/ DIFFERENTIATION:

<u>One Student with ADHD</u>

Providing this student with opportunities to move and discuss with table groups is typically best practice for this student. Throughout the lesson there are several opportunities for students to engage in discussion and movement. The student is also allowed to stand behind the chair at his table if it is difficult to remain sitting.

<u>Title One Students</u>

There are 4 students in the class who attend Title One intervention for additional reading support and instruction. Providing these students with additional adult support will assist in any difficulties with reading directions or writing as well as helping these students complete their work. The instructional aides and classroom assistants will be given several students or specific table groups to assist during the Group and Independent Practice portion sections of this lesson.

<u>2 Autistic Students</u>

In our classroom we have two instructional assistants (one in the morning and one in the afternoon) who work with students in our classroom, specifically targeting the two students with autism. Throughout this lesson I will make sure to have the instructional assistant specifically focus on these two students to provide them with any support they may need. When gathered at the carpet I will also make sure to position these students towards the front where I can easily access them as well as provide them with additional wait time when asking them questions.

ASSESSMENT

1. **Evidence collected from this lesson:**
   - Observation of students completing the science journal observations
   - Participation in KWL chart
   - Describe a Ladybug worksheet
   - Label the Insect worksheet

2. **Dates of formative assessment:** May 4, 2015

REFLECTION:

1. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.**

Scoring the observation in the science journals will occur upon completion of the unit. However, from my observations I noticed that many of the students were capable of making at least 3 observations of the live insects. Students still need prompting to complete their observations but my hope is that this practice will become easier with practice throughout the unit.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

Throughout the lesson I made several changes, mostly as a result of time. I removed the transition in which students were to look at the image on the Document Camera because I immediately had them engage in group discussion of the insect images I placed on their tables. This seemed to work well for the students and allowed me to walk around ad get a quick idea of where individual students and groups were at in their knowledge and/or the skill of observation. A major change to this lesson was that I was unable to complete the closure part of my lesson due to time constraints. Students were completing their worksheets while I was having small groups come over to complete their observations. Unfortunately, I was unable to complete the closure that I had planned in order to review our learning and the KWL chart. I also have a small group of students that were unable to complete their science observation journals. My plan is to have them complete these journals tomorrow morning so they are still "on track" with their peers.

REFLECTION:

3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.

Due to time I feel that I did not take as much time going through the teaching portion of the lesson as I should have. Despite this however, the students did fairly well on their individual activities. During the work time students were slightly distracted and noisy. I feel that this was a result of being slightly confused about their activities. I would have spent more time explicitly modeling my expectations rather than quickly explaining the activities. I also would spend more time having students practice making good observations (i.e. the caterpillars are hairy rather than the caterpillars are cute.).

REFLECTION:

4. How will the results of this lesson influence the way that you will teach in the future?

I noticed from the worksheets that many students are reversing the parts of the insect that are the thorax and the abdomen. In order to help with this I have a song that I am going to teach the students and have them practice. I will also plan to review the body structure of an insect in the upcoming lessons. This lesson also reinforced that I need to provide students with explicit modeling and instructions so they know what to do at every moment. I also feel that I need to monitor the noise level in the room slightly better in order to maintain a positive learning environment.

Lesson #2

Date of Lesson: May 5, 2015

HEADING

Lesson Title/Description: Life Cycles

Lesson # 2 **of** 10	**Time Allotted for this Lesson:** 40 min (12:20-1:00)

GOALS:	**OBJECTIVES:**
Goal 1 1.LS.1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	**Objective 1.1** Following a demonstration of scientific journal observations, students will individually make at least 3 observations, from the suggested checklist, of the live caterpillars/butterflies in their science journals. **Objective 1.3** After watching a short video, students will replicate the life cycle of a butterfly using a sequence worksheet.

PRE-REQUISITE KNOWLEDGE OR SKILLS:

Students will be using the information from the previous lesson to continue making observations in their science journals about the live caterpillars being raised in the classroom. Students will also be cycling through some centers that allow them to engage in a variety of activities so they must know how to move quickly from one station to another. Students will also need to use their knowledge of discussion with their table members with respect.

MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION:

- Ladybug Life Cycle Cards
- The Caterpillar worksheet
- Live Caterpillars-kept in the classroom
- Student Science Journals

- *Buzz! A Book About Insects* by Melvin Berger (Chapter Two)
- *Magnificent Monarchs* by Linda Glaser
- Video of Butterfly Life Cycle- https://www.youtube.com/watch?v=3jl8P0w6X0g
- "I was most confused by..." cards (25)

VOCABULARY USED/INTRODUCED:

- Egg
- Larva
- Pupa/Chrysalis
- Adult
- Life Cycle

PROCEDURE: ***Teacher Does….***		***Students Do….***	
Time	**Anticipatory Set, Motivation or hook:** Gather students to the front carpet area to read Chapter Two of *Buzz! A Book About Insects.* Ask students questions about the life cycle of insects from the book. • What is the first step? Second step? Third step? etc. • What stage is our "specimen" at currently?	**Anticipatory Set, Motivation or hook:** Students will meet on the carpet and listen to Chapter Two of Buzz! A Book About Insects. Students will provide answers about the life cycle.	
15 min	**Teaching/Modeling:** Have students return to their table groups. Pull up video and play the video for students to watch. Give table groups images of the different stages of the life cycle. Ask them to put the life cycle in order with their table group members. Have 2-3 table groups model their finished product on the document	**Teaching/Modeling:** Return to seats. Watch the life cycle video. Work with the members of their table group to put their images in the correct order of the life cycle. One student from 2-3 groups will bring their pictures up to the document camera to explain and model their life cycle.	

	camera. **Check for agreement from the whole class before moving on** Can anyone tell me what the four stages of the life cycle are? (ask for volunteers) "Let's practice putting these pictures in order. The ones we are practicing with are the life cycle of a ladybug but we will also practice with the butterfly later." Have students assist in putting the pre-cut ladybug life cycle images in the correct order of the life cycle.	Answer questions regarding the life cycle First students will turn and talk with their table groups about which stage comes first in the cycle (as well as second, third, and fourth). Volunteers will come up and assist in putting the ladybug life cycle pictures in the correct order.	
10 min	**Independent Application/ Independent Practice:** Students will complete The Caterpillar worksheet (pictures & word bank). Walk around and assist students with the activity.	**Independent Application/Independent Practice:** Students will complete The Caterpillar worksheet. This involves completing the sentences with words from a word bank and drawing a small picture. Students may use the plastic insect models or the images to assist them.	
5-7 min	**Closure/ Sharing:** Have students gather on the front carpet Read *Magnificent Monarchs*. As you read, stop and ask students which stage each picture is at throughout the life cycle. Hand out "I was most confused by..." card and have students complete the sentence. Use this to review the next lesson.	**Closure:** Sit down on the carpet. Listen to the story. Answer questions about the life cycle of the Monarch Butterfly throughout the story. Students will fill out the cards and turn them in.	

MEETING VARYING NEEDS/ DIFFERENTIATION:

Students absent from Lesson #1

These students will need the information from the previous lesson. During W.I.N. (what I need most) time students will engage in a small intervention group to work on the material from the previous lesson. This shortened intervention time (approximately 30 minutes) will focus on the most important details and information that the students need to understand the material as well as to participate in Lesson #2.

Title One Students (4 members)

All of the directions will be read aloud for all students to ensure maximum understanding. Many of the activities and manipulatives are also image-based, eliminating the majority of written text for students to read.

Student with ADHD

The student will be engaged in discussion with his peers. If necessary, the student will also be allowed to stand behind his chair, use a bumpy seat or T-stool to help with any fidgeting. This student also typically works best if there is an adult sitting at his table to ensure he stays focused on the task at hand so I will make sure to have an adult assisting the students at that table specifically.

ASSESSMENT

2. **Evidence collected from this lesson:**
   - "I was most confused by..." cards
   - Students engaged in discussion

2. **Dates of formative assessment:** May 5, 2015

REFLECTION:

2. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.**

From the data I have collected it seems that students are still struggling with the concept and knowledge of the insect life cycle. Many of the students were able to put the steps in order in a group, however when asked to identify an individual step many students were still confused. Students will continue to work and practice these applications in the next lesson.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

While I was teaching I decided to remove the book I was going to read during the closure portion of my lesson. I did this partially because of time constraints as well as leaving some time for review. It was clear to me that the students were still struggling with this concept while they were completing the life cycle activity. Students will be receiving additional instruction on this topic and will engage in three different stations in the next lesson that allow them to continue practicing. In order to get a better understanding of where they were at upon completion of the lesson, I removed the story I had planned on reading and focused on having the students fill out the cards stating "I was most confused by". By doing this I am better able to gauge what I need to focus on tomorrow.

REFLECTION:

3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.

I would have added in additional practice with identifying the stages of the life cycle randomly. In groups students were able to complete the ordering of the life cycle however many of them were not able to identify what the stage of the life cycle was when a stage was randomly selected and shown to them. For example, when holding up the caterpillar students were unable to identify the caterpillar as the larva stage. I would add in additional small group and whole group practice with this random identification.

I also would have picked a different worksheet/activity for the students to do. I like the activity in the lesson plan, however I did not initially realize that is was 3 pages (front and back). The activity was a lot to have the students do in the amount of time I had and will still take them some time to finish. I take full responsibility for not correctly understanding the activity prior to scheduling it in to the lesson. As a result, students will be receiving additional time to work on the activity and finish it.

REFLECTION:

4. How will the results of this lesson influence the way that you will teach in the future?

Time continues to be a major factor in my lesson plans. The aspect I struggle with the most is that there is so much information that needs to be taught to the students that it is difficult to cover it all in the allotted time. My formative assessments also indicated that some review should be added to the next lesson to help build understanding of the 4 stages of the life cycle. I believe the stations built around the life cycle in the next lesson will help provide students with the additional support and practice that they need.

Lesson #3

Date of Lesson: May 6, 2015

HEADING

Lesson Title/Description: Life Cycle Stations #2
second half of Lesson #2

Lesson # 3 **of** 10	**Time Allotted for this Lesson:** ~45 minutes

GOALS:	**OBJECTIVES:**
Goal 1 1.LS.1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	**Objective 1.1** Following a demonstration of scientific journal observations, students will individually make at least 3 observations, from the suggested checklist, of the live caterpillars/butterflies in their science journals. **Objective 1.3** After watching a short video, students will replicate

	the life cycle of a butterfly using a sequence worksheet.

PRE-REQUISITE KNOWLEDGE OR SKILLS:
Students will be using the information from the previous lesson to complete the station work. There will be a short review at the beginning of the lesson to ensure that the information is fresh in the student's minds. Students will be rotating from station to station so they must remember how to quiet down when asked and to move quickly and quietly to the next station. Students will also be completing the stations in small groups so students will be practicing social interaction skills with their peers.

MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION:

- Butterfly Life Cycle Cards
- Ladybug Life Cycle Cards
- Life Cycle Books cards
- Caterpillar Book Shape
- Live Caterpillars-kept in the classroom
- Student Science Journals
- Pencils
- Scissors
- Glue Sticks
- Timer
- *The Butterfly* by Anna Milbourne and Cathy Shimmen

VOCABULARY INTRODUCED/USED:

- Pupa/chrysalis
- Adult
- Egg
- Larva
- Life Cycle

PROCEDURE: ***Teacher Does….***		***Students Do….***	
Time 5 min	**Anticipatory Set, Motivation or hook:** **Gather students on the carpet** "Do you remember yesterday, we were talking about the life cycle of insects? Who can remember the 4 different stages?" Read *The Butterfly* by Anna Melbourne and Cathy Shimmen	**Anticipatory Set, Motivation or hook:** Answer the questions asked. Listen to the story, participating when asked.	

	• As you read, stop and ask students to identify the stage of the life cycle.		
~ 7 min	**Teaching/Modeling:** **Review the life cycle from the day before** (This will depend on the "confusion cards" from the day before. Give groups of students the life cycle manipulatives and have them put themselves in order from beginning to the end. There are 3 stations students will be completing today: • Butterfly & Ladybug life cycle worksheets • Butterfly life cycle caterpillar booklet • Caterpillar observations in science journals. Students will then be broken up into three separate groups (decided before the lesson) to complete "stations" for each activity.	**Teaching/Modeling:** Students will order themselves according to the life cycle. Listen to the 3 stations and the expectations for every student. Ask questions for clarification if necessary. Listen for their name as to which group they are in and move to that area quickly and quietly.	

30 min (~10 min/station)	**Independent Application/ Independent Practice:** Each group will complete their activities at the different stations. There will be an instructional aide or teach at each station to help the students. 1. Butterfly & Ladybug life cycle worksheets • Cut and glue both life cycles in order of the stages 2. Caterpillar observations in science journals • Make observations of the caterpillars in their science journals • May include drawings as well as 3 written observations 3. Butterfly life cycle caterpillar booklet • Cut and paste the life cycle in order on the caterpillar booklet form. • Create the eyes and antennae for the caterpillar	**Independent Application/Independent Practice:** Students will complete the activities at each station.	

	booklet • Color the pictures if there is still time.		
2 min	**Closure/ Sharing:** Post a question such as "What is the third stage of the life cycle called?" and have students post a sticky note with their answers.	**Closure:** Students will post a sticky note with the answer to the question asked.	

MEETING VARYING NEEDS/ DIFFERENTIATION:

<u>Students absent from Lesson #1</u>
These students will need the information from the previous lesson. During W.I.N. (what I need most) time students will engage in a small intervention group to work on the material from the previous lesson. This shortened intervention time (approximately 30 minutes) will focus on the most important details and information that the students need to understand the material as well as to participate in Lesson #2.

<u>Title One Students (4 members)</u>
All of the directions will be read aloud for all students to ensure maximum understanding. There will also be an instructional aide or teacher at every station to help students complete the activities as well as to answer any questions students may have.

<u>Student with ADHD</u>
While many of the activities do require students to remain seated, they activities are hands-on. The students will also be rotating approximately every 10 minutes, which will allow students to get out of their seats and move to the next station. These stations will also help to keep the movement of the activities more fast-paced so that this student does not become bored and begin to fidget.

ASSESSMENT

3. **Evidence collected from this lesson:**
   - Butterfly Life cycle cards
   - Ladybug life cycle cards
   - Butterfly life cycle book
   - Observation of science journals.

2. **Dates of formative assessment:**

REFLECTION:

3. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.**

Students continued to do well making observations in their science journals. When they were confused or unsure of the observations to make they were prompted to use the idea checklist and they found quite a bit of success. Student's knowledge of the life cycle continues to grow as they complete the different activities. Several students appear to need additional time/activities in order to solidify their understanding. In order to assist with this I have planned some additional activities for students to complete during their morning language jobs that will allow students to practice using this knowledge.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

I had to greatly extend the amount of time we were in stations because students were unable to complete the activities in the amount of time I had originally planned. It took students approximately double the time I had a originally planned. I also chose to not have student's complete/turn in the sticky notes as part of the closure. Instead I went around to the tables and talk with the students about their learning. I felt that this was a better measure of the students learning and understanding.

I used the information gather from the "confusion cards" from the previous lesson to review the life cycle material. Students struggled with random identification and still needed practice ordering and naming the stages. I also emphasized that there is more than one correct name for some of the stages. For example the third stage of the life cycle can be called either the pupa or the chrysalis.

REFLECTION:

3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.

Time continues to be my biggest factor in the lesson plans. I personally feel that all of the different activities I planned for my stations could have been three individual lessons. This played a major role in the time factor of my lesson plans. The biggest change is that I would not plan these three activities together. Instead I would decrease to only two of the activities in one lesson and give the students more time, or I would split the activities into three separate activities.

REFLECTION:

4. How will the results of this lesson influence the way that you will teach in the future?

I am consistently learning to overestimate the amount of time it will take students to complete something and plan some additional activities in case they finish early. Overestimating the time it will take is far better than underestimating the time the activity requires. My students required significantly more time to complete the activities than I had originally given them. Flexibility is also key in the world of teaching. Sometimes, despite all of the planning in the world, students will take longer to do something than planned. Being flexible and simply adjusting the plan is essential for success.

I will continue to take time into consideration in future lesson planning. I feel that it

would be beneficial to plan less so that way students are not being rushed through the teaching and activities. By allowing enough time, I can help ensure a deeper level of understanding. This is still something I am working towards and must acknowledge that I will not be able to perfect the situation overnight or instantly.
I was able to see the benefit of reviewing material for the next lesson. This review allowed students to develop a deeper understanding of the material and to grasp the concepts with a better understanding. The review also helped to build the necessary vocabulary for the science unit being conducted (i.e. egg, larva, pupa, adult, caterpillar, chrysalis, butterfly).

Lesson #4

Date of Lesson: May 7, 2015

HEADING
Lesson Title/Description: Insect Measurement

Lesson # 4 **of** 10	**Time Allotted for this Lesson:** 60 minutes

GOALS:	**OBJECTIVES:**
Goal 2 1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.	**Objective 2.1** After a review of proper measurement strategies, students will complete a worksheet activity where they will correctly measure the insects 80% of the time. **Objective 2.2** After modeling how to measure the live caterpillars, students will record at least 5 different length measurements of the live caterpillars in a prepared chart in their science journal.

PRE-REQUISITE KNOWLEDGE OR SKILLS:
Student will be using their prior knowledge about measurement with a variety of measurement units in this lesson. This lesson focuses as an additional review and practice of measurement. The main focus it to discuss and practice techniques that "real scientists" use. Students will also engage in basic counting (counting the length units) that they have been practicing since the beginning of this school year. It is unlikely that the students will be counting higher than 10 units.

MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION:

- Rulers
- Math toolbox (one for every student)
- Insect Measurement Worksheet
- Insect Measurement Images
- How Big is the Butterfly? Worksheet
- Student Science Journals

- Pencils

ACADEMIC VOCABULARY

- Inches
- Measurement

PROCEDURE: ***Teacher Does….***		***Students Do….***	
Time	**Anticipatory Set, Motivation or hook:**	**Anticipatory Set, Motivation or hook:**	
10 min	Gather students on the carpet Number Corner • One student will color in the number of days in school and write the number of days on the place value board • Entire class will count and verify the students answer • Play "Guess my Number Game"(students ask elimination questions to try and guess teachers number)	Sit down on the carpet. Count the number of days in school by skip counting ("skip" chosen by student). Participate in asking questions to determine the teacher's number.	
7 min	**Teaching/Modeling:** Have students return to their seats. "We have been practicing being scientists for the last couple of days while we watch our caterpillars grow. One thing that scientists do all the time is measure their specimens. We have been practicing measurement quite a bit so I just want to review how we measure things." Review measurement of images. • Measure from line to	**Teaching/Modeling:** Return to their seats. Participate when asked questions.	

	line • Round down if less than half of the next Unifix cubes. Round up if half or more.		
	Group Application/ Guided Practice: Have students practice by measuring one of the plastic bugs at their table. Ask for volunteers to share their measurements. "In your groups you are going to measuring a variety of different pictures using your Unifix cubes." (Show the students the papers they will be measuring) Students will be broken into groups to work on the measurements. (Grouped according to "skill level" on the pre-assessment)	**Group Application/ Guided Practice:** Use their Unifix cubes to measure one of the plastic bugs at their table. Compare their measurements with their table partners. Volunteer answers when we come back together. Move to their groups quickly and quietly.	
	Independent Application/ Independent Practice: Each group/ station will be "run" by an instructional aide or teacher. Stations: 1.Measurement of Caterpillars • Students will be using a modified paper ruler to take measurements of the caterpillars as they grow in the containers. 2.How Big is the Butterfly? • Students will use either a ruler or Unifix cubes to measure the	**Independent Application/Independent Practice:** Students will rotate around to the different stations and complete the activities as each station. If students finish early they will turn in their work and proceed to working on their individual math packets.	

	different butterflies on the worksheet. • Then compare and decide which butterfly is the biggest. 3.Insect Measurement activity • Students will measure 6 different images of insects and record their measurements on a separate piece of paper. Assist students in measuring at the different stations using the rulers or Unifix cubes. Make sure that students are measuring correctly. Have the students compare their answers once they have completed each activity.		
	Closure/ Sharing: "What are some ways that scientists would use measurement? Do you think they use measurement for any of the same reasons that we did today?"	**Closure:** Students will offer ideas and suggestions to the questions.	

MEETING VARYING NEEDS/ DIFFERENTIATION:

Students who "ace" the pre-test

Students who "ace" the pre-assessment will still be participating in the measurement activity. However, these students will receive a bit more direct instruction about how to measure using a ruler. Once they have received this instruction, these students will complete the same measurement activity measuring the insects with a ruler (inches) rather than Unifix cubes.

Student with ADHD

While many of these stations require the student to remain sitting or stationary for a small length of time, the student will be working with manipulatives or other hands-on materials in each station. The students will also be able to get up and move about the classroom approximately every ten minutes. While this is not much time for movement, it will allow the student a quick brain break and allow for some stretching.

Title One Students

Students will be working in smaller groups for the math stations, allowing more intervention and individual attention for every student. The activities in this lesson rely heavily on pictures and manipulatives, with very few reading materials required. All instructions will be read aloud to the students, decreasing on the amount of reading required by the students. If the students need further assistance with the measurement activities, they will be able to receive this from the instructional aid or teacher at that station.

2 Autistic Students

These two students will be receiving small group instruction throughout the math stations. I will purposefully instruct my instructional aids and other teachers to position these students in seats that are closest to them so that they may discreetly receive additional assistance or any additional support. I will do this in my own personal group as well to appropriately support these students.

ASSESSMENT

4. **Evidence collected from this lesson:**

- Measurement worksheets

2. **Dates of formative assessment:** May 7, 2015

REFLECTION:

4. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.**

This lesson was mostly review on the topic of measurement for the students. However, when rotating through the stations the students appeared to be doing very well. I had originally planned to have the students measure using Unifix cubes (non-standard unit of measurement) however the students did so well with this on the pre-assessment that my teacher and I discussed changing the type of measurement to inches. This appeared to work very well for my students.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

During the teaching of this lesson I decided to remove the "guess my number game" from the number corner activity. Students really enjoy this activity but it takes quite a bit of time. Instead I added in review/practice of the coins we have been learning about (singing out coin song & creating the date in change) and decided that we would return to playing the game during the closure at the end if we had some time.

During the teaching portion of the lesson I spent a small amount of time reviewing the use of Unifix cubes and spent more time focusing on measuring in inches on a ruler. We focused specifically on the importance of lining up the beginning of the ruler with the beginning of the image being measured.

When teaching I also decided to remove the guided application section. I chose to do this in order to provide students with more time to complete the activities in the stations. I also chose to do this because of the level of understanding displayed by the students on the pre-assessment. Students demonstrated that they were capable of completing individual measurement activities on the pre-assessment so I felt it was a better use of time to spend more time on the individual activities rather than group application.

REFLECTION: **3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.** The part of this lesson that currently proves to be the most concerning is that this was the first day of the unit that the students measured the live insects. We were observing them today and it appears that the caterpillars may be beginning to form their chrysalis over the next couple of days. This is potentially problematic for my objective of students measuring and recording data. The change I would make would be to have had students engaging in measuring the insects prior to this lesson so they had some practice with this.
REFLECTION: **4. How will the results of this lesson influence the way that you will teach in the future?** The students really enjoyed being able to move around to different stages approximately every 10 minutes. This constant movement and changing allowed me to receive several different measurements of their knowledge/ability in this concept. It also helped keep the level of student engagement high. Students at this age struggle to maintain engagement and focus on one activity for long periods of time so by doing stations they are only focusing on one activity for approximately 10 minutes. While stations are extremely positive for learning, it is also essential that there are several adults in the classroom at the time. The stations function smoothly when there is an adult facilitating them. The adult/teacher can also use this time to provide more direct instruction to a smaller group, which can be more effective. I like this model of learning but it is important to keep these conditions in mind.

Lesson #5

Date of Lesson: May 7, 2015

HEADING **Lesson Title/Description:** Insect Research Projects	
Lesson # 5 **of** 10	**Time Allotted for this Lesson:** 30-45 minutes
GOALS: **<u>Goal 3:</u>** 1.W.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).	**OBJECTIVES:** **<u>Objective 3.1</u>** After explicit modeling on finding information from a text, students will first, use the text to individually find 2 pieces of information about an insect.

PRE-REQUISITE KNOWLEDGE OR SKILLS:
Students will be using their reading skills to look through the printed pages to research facts for their informative writing. Students will also be using their informative writing skills that they have been developing over the course of the school year. Working in partners respectfully is also a required skill for this lesson.

MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION:

- Fact Sheets (25 copies)
- Informative Writing Plans
- Pencils
- *Buggin' with Ruud* (Animal Planet)
- *Over in the Garden* by Jennifer Ward
- Survey/Check-in sheets

VOCABULARY USED/INTRODUCED:

- Molting
- Metamorphosis
- Egg, larva, pupa, adult

PROCEDURE: ***Teacher Does….***		***Students Do….***	
Time	**Anticipatory Set, Motivation or hook:**	**Anticipatory Set, Motivation or hook:**	
5-7 min	** Meet at the carpet** Read *Over in the Garden* by Jennifer Ward Ask some re-tell questions • What were some of the insects we read about? • Did you notice any rhyming words? • Spider page: Are spiders insects? Why not?	Sit at the carpet. Listen to *Over in the Garden* by Jennifer Ward Answer questions about the book • Praying Mantis, roly-polys, ladybugs, dragonflies, bees, etc. • Rhyming words every other line • No, because they have 8 legs. They are arachnids.	
10 min	**Teaching/Modeling:** "Now that we know some facts about insects we are going to be writing some informational writings about insects. You are going to be working with a partner to research one bug to write about." Model how to research from a text to write/fill in the informative	**Teaching/Modeling:** Students will remain on the front carpet and watch the modeling of the research process.	

	plan. Use *Buggin' with Ruud* to model. • "I chose the butterfly because we have been learning about a lot of different insects, but you can chose any of the insects that we have on the list" • First I will read through the text and highlight the most important parts that I might want to write about. • Next my partner and I will each pick the two most important facts (4 total) for our writing piece. • Next lesson we will be actually writing out insect pieces. Pair students together and have them decide on an insect to study. • Pair according to ability level (attempt to pair struggling students with higher level students to provide support)	Ask questions if they don't understand. Students will get with their partner and decide on the insect they will be researching.	
20 min	**Group Application/ Guided Practice:** Once partners have decided which insect they would like to research, handout the appropriate pages for the students to read as well as the fact sheets each student will complete before writing. Walk around and help students with any difficult reading or tricky words. Students may also need help with filling in the fact sheets.	**Group Application/ Guided Practice:** In pairs, students will decide on the insect they will be researching. Once they have decided and informed the teacher they will collect their reading and the fact sheets to be completed. Students will individually read the copied book page and choose the 2 most important pieces of information for their fact sheet. They will record these facts on their fact sheet and discuss with a partner. The partners must agree on the 4	

	Once each individual has the fact sheet filled out, have the pair discuss their four facts (make sure they both don't say the same thing). Together hand them the plan to complete as a group. Students should complete the informative plan together	***different*** facts before requesting a plan sheet from the teacher. Students will complete the informative plan together. **Students who finish their research and plan early may begin on their writing piece. But double-check work before approving. Must be their best work!**	
2 min	**Closure/ Sharing:** Pass out a small survey that checks in with students to see how far they have come in the writing process. Have the students check the box that describes where they are at in the writing process. Have students share some of the facts they are finding to helps solidify the meaning of a "fact" for other students. • Is that a fact or an opinion?	**Closure:** Each pair will complete a checklist that conveys to the teacher the step of the writing process that have completed. This will be handed in at the end of the unit. Students will share some of the facts they have found from their reading activity.	

MEETING VARYING NEEDS/ DIFFERENTIATION:

Title One Students (4 members)

For this lesson in particular, these students will need additional support from their peers as well as supervising teachers. The text in these books is advanced for most first grade students meaning that additional support will need to be provided. I will be pairing these students with another students who read "above grade level". This pairing will provide additional support on a peer level for these students. I will make sure to check-in frequently with these students to help them with the reading.

Students with ADHD and Autism

These students can find it particularly difficult to get their words on to paper. I will make sure to pay careful attention to these students and provide them with my support when necessary. It may be most beneficial during this research and planning stage for them to engage in a "share the pen" writing state in which they verbally explain what they would like to be written on their fact sheet and plan. This may be a "shared pen" with either an adult or their partner if necessary.

Students who are absent

The students who are absent will either be assigned as partners together (if there is an even number) or a student in class will be assigned an absent partner. The student who IS in class will simply work through the research and fact sheet individually as planned and will have the partner discussion during the following lesson. The partner who was

not absent will be partially responsible for explaining what insect they will be researching as a team.

ASSESSMENT

5. **Evidence collected from this lesson:**
   - Student fact sheets
   - Student plans
   - Check-in list

2. **Dates of formative assessment:** May 7, 2015

REFLECTION:

5. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.**

During this lesson students did not make it through as much of the activity as I had hoped for this lesson. Some students were able to successfully complete the fact sheet at the very end of the lesson, however it was clear that many students needed additional time. This affected my lesson plans during the lesson as well as the expectations for the future lesson. Students who completed the fact sheet showed the ability to locate two key pieces of information in a text that they will use to write a small research paper.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

I did not have the students fill out the group check-in sheets because it took the students so much longer to work through the fact sheets. I believe that the text I used for the students to read as their research was too difficult for them to make it through individually. This greatly affected the amount of work that students could get through during this lesson. I spent much of the time when the students were working walking around to all of the different groups assisting them with reading and finding facts. As a result, I knew exactly where all of the groups were at when finishing the lesson. I decided to save those check-in sheets for the next lesson when it is more likely for different groups of students to be at different parts of the writing process by the end of the next lesson.

REFLECTION:

3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.

The major change that I would make would be to either use text that was more at the reading level of the students or to group them by subject. Instead of using this text I could have typed up simpler versions of the text that was more at the ability level of the students in my class. The other option would have been to have the pairs of students that were studying "like" insects (such as all of the students studying grasshoppers) with an adult/teacher to provide more support for the reading. The teacher would have read the text while students followed along in order to better scaffold the text and lower the student's affective filter within the activity. This option would have still provided students with the exposure to the more difficult text but would have provided the students with more support while reading.

REFLECTION: **4. How will the results of this lesson influence the way that you will teach in the future?** In the future I will provide either more scaffolding or support for reading the difficult text or provide students with a more simple text for the activity. The main struggle throughout this lesson was that the reading was difficult for student's to read and understand and created a barrier in completing the activity. I will keep this in mind for future lesson plans.

Lesson #6

Date of Lesson: May 8, 2015

HEADING **Lesson Title/Description:** Insect Research Papers-continued	
Lesson # 6 **of** 10	**Time Allotted for this Lesson:** about 35 minutes
GOALS: **<u>Goal 3:</u>** 1.W.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).	**OBJECTIVES:** **<u>Objective 3.1</u>** After explicit modeling on finding information from a text, students will first, use the text to individually find 2 pieces of information about an insect. **<u>Objective 3.3</u>** After individually identifying two pieces of information about an insect of their choice, in pairs students will use the information to write a short informational writing piece (minimum of 3 sentences) about an insect of their choice.
PRE-REQUISITE KNOWLEDGE OR SKILLS: Students will be using the informative plans and fact sheets they completed during the previous lesson to complete the informative essay in this lesson. They will be accessing prior knowledge about handwriting, phonetic spelling, and use of their word wall and students dictionaries. Students will also need to be aware of the social interactions that occur when working with partners to complete a writing assignment (they have done this before).	
MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION: • Informative plans completed the day before • Student fact sheets (completed the previous lesson) • Lined writing paper • Pencils • *Hey, Little Ant* by Phillip and Hannah Hoose	
PROCEDURE: ***Teacher Does….***	***Students Do….***

Time	Anticipatory Set, Motivation or hook:	Anticipatory Set, Motivation or hook:	
5 min	**Gather students on the front carpet** Read *Hey, Little Ant* by Phillip and Hannah Hoose Ask comprehension questions • Did you notice any rhyming words? • What was this story about?	Sit down on the carpet	
10 min	**Teaching/Modeling:** "Please turn your bodies so that you are facing the board. I need all eyes and ears on me and all voices off." "Yesterday we worked to get our fact sheets and plans done. Today, you and your partner are going to be putting that information into the finished writing piece" Model for students using the fact sheet and plan completed in the model in the previous lesson. • Think out loud while writing to make sure that students are being modeled the writing process.	**Teaching/Modeling:** Students will turn their bodies and sit quietly on the carpet. Watch the teacher model the writing process from plan to formal piece.	
2 min	**Group Application/ Guided Practice:** "Remind me again what we are always looking for in our writing pieces? What are the steps you are going to go through and check off?"	**Group Application/ Guided Practice:** Students will engage in a quick discussion about the process of "editing" or checking a piece of written text. • Examples: topic sentence, 3-4 supporting details/facts, concluding sentence, punctuation,	

	(Students offer ideas/suggestions) • Examples: topic sentence, 3-4 supporting details/facts, concluding sentence, punctuation, word wall words correct, capitals "When I say the color of your table please get out your writing folder and find a space for you and your partner to work on your writing." (Red, Yellow, Green, and Blue)	word wall words correct, capitals Students will stand up and collect their writing folder when the color of their table is called. They will then find a space for themselves and their partners to work.	
15-20 min	**Independent Application/ Independent Practice:** Walk around and facilitate partner work while students are working on completing their writing pieces. Help students who are confused or stuck. Answer any questions; help with spelling or reading, etc. **Absent students:** During this time, pull any students who were absent from the previous lesson to the back table for a quick/short mini lesson and explanation of what they should be doing.	**Independent Application/Independent Practice:** Students will work with their partners to complete their informative plan and begin/finish writing their informative writing pieces. When confused, students should raise their hand to ask for help from an adult in the room. **Absent students:** If students were absent for the previous lesson, they will join the teacher at the back table for a short mini lesson covering the objectives from the previous lesson as well as to receive the instructions for the assignment they are completing with their partners.	
2-5 min	**Closure/ Sharing:** ** Gather at the front carpet** If students have completed writing assignment: Have students who have completed their writing pieces share their	**Closure:** **Gather at the front carpet** If finished, students will share their pieces. Other students will be listening to the pieces being shared.	

	writing. <u>If students are not finished:</u> Gather students at the front carpet and discuss the insects they are studying and researching. Are there any amazing facts they want to share with the group?	Students will provide answers to the questions (i.e. what insects are we researching? Are there any amazing facts you have learned that you want to share with the group?"	

MEETING VARYING NEEDS/ DIFFERENTIATION:

<u>Students absent during the previous lesson</u>

Students who were absent will either have been paired with another student in the class who was present during the previous lesson or (if there is an even number absent) will be paired with other students who were absent. If they student has a partner that was present during the previous lesson then the partner will assist in explaining the assignment to the student. If both students were gone, the pair will be pulled to the back table for a short mini lesson to get the students up to speed.

<u>Title One Students</u>

I will be partnering students on the first day and I am intentionally partnering students who need extra support in reading and writing with students who are consider "above" grade level in reading. This pairing will help provide additional support to these students from their peers. I will also make sure to check-in with these students frequently to check for progress and provide any assistance they may need.

<u>2 Students with Autism</u>

During this writing activity these students will be working with partners as one method of additional support as well as to encourage social interaction. In addition, I will have the instructional aid pull these two students and their partners to the back table for some one-on-one attention if they need it. By moving students to the back table the instructional assistant can ensure that the students remain on task as well as provide additional support with the reading and writing aspect of the assignment.

<u>Student with ADHD</u>

This student enjoys working with a partner, particularly on a topic of his choice. By allowing him choice of his topic (on the previous lesson) and encouraging partner work this student will be receiving support in his writing. In addition to receiving focused support and assistance from an adult, this student will also be receiving support from the partner he is working with for the assignment.

ASSESSMENT

6. **Evidence collected from this lesson:**

- Student plans
- Student written informative essays

2. **Dates of formative assessment:** May 8, 2015

REFLECTION:

6. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.**

During this lesson students made enormous progress towards meeting Objective 3.1. As stated in my reflection for the previous lesson, the student's required more time to complete the fact-finding sheets and plans than I had originally anticipated. As a result, I made quite a few adjustments in my teaching to accommodate that. Most students were able to find their 4 facts (2 for each member of the team) and began to complete their writing plans. This means that students have not yet started on their final writing drafts, therefore not yet meeting Objective 3.2.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

As stated above, I made many changes while teaching this lesson in order to accommodate the needs of my students. In the previous lesson students were not able to complete as much as I had originally planned/thought. As a result, I made some changes in the teaching portion of this lesson. Rather than modeling the final draft I modeled how the students would complete the plan portion of this writing assignment. While many students were still working on finding their facts, there were several students who were ready to move on to this next step. This proved to be a good decision because most groups had started their plans by the time the lesson was completed.

I did not complete the closure of my lesson that included the sharing because students were not yet in a place where they were ready to share their papers or ideas. Instead I decided that students should use this extra time to continue working with their partners. Instead I simply had the pairs complete the writing "check-in list" to let me know where they were at when finishing the lesson for that day.

REFLECTION:

3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.

I thought this lesson went very well today and I thought that I would not have changed anything about the lesson to better support my students or change any areas to function better. Similarly to the previous writing lesson however, I wish I had made some different decisions regarding the text the students were using for their research. Changing the method of delivery for the research information would be the big change that I would make for this lesson.

REFLECTION:

4. How will the results of this lesson influence the way that you will teach in the future?

The main lesson I learned from this teaching experience was to provide students with a text that was more at their level or provide them with more support during the reading via small groups. During this lesson students were more relaxed regarding the reading but I do know that the difficulty of the text presented a barrier for some students during this lesson. I have also learned the importance of grouping/pairing mixed ability level. I have found this to be really successful because I attempted to group a higher-level student with a lower-level student to provide more support for the struggling student. This has been extremely important during this lesson.

Lesson #7

Date of Lesson: May 8, 2015

HEADING **Lesson Title/Description:** Bug Hunt		
Lesson # 7 **of** 10	**Time Allotted for this Lesson:** 35-40 minutes	
GOALS: **<u>Goal 1:</u>** 1.LS.1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	**OBJECTIVES:** **<u>Objective 1.2</u>** In pairs, students will engage in a bug hunt where they will each document a minimum of 4 bugs, after listening to the book *Bug Safari*	
PRE-REQUISITE KNOWLEDGE OR SKILLS: Students will be using the information they have learned about the life cycle and body structure of insects while engaging in a Bug Hunt in this lesson. Students will also be using their knowledge and skills of social interaction and discourse while working in pairs to complete the activity. Students will also be reminded of the appropriate behavior while out on the school grounds (i.e. quiet in the hallway, kind and courteous to others, etc.)		
MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION: • *Bug Safari* by Bob Barner • Bug Hunt Worksheet packet (one/student) • Magnifying glasses • Whistle **ACADEMIC VOCABULARY:** • Safari: exploration, when you are looking for something • Habitat: Where the insects live		
PROCEDURE: ***Teacher Does….***	***Students Do….***	
Time	**Anticipatory Set, Motivation or hook:**	**Anticipatory Set, Motivation or hook:**
7 min	**Gather student on the front carpet** "We have been learning a lot about insects! Lets review some of the things we have learned this week about insects. Who can tell me something they have learned?"	Gather on the front carpet. Students should sit in a location where they will not talk with their neighbor and can be respectful. Offer up suggestions and ideas of things they have learned about insects. Students may refer back to the KWL chart. Listen to the *Bug Safari* book read-aloud.

	• Refer back to the KWL chart Read *Bug Safari* by Bob Barner		
5 min	**Teaching/Modeling:** "Boys and girls, today we are going to be just like the little boy in this book. We are going to go on a Bug Hunt!" Explain the activity and the expectations. • We will be going out on to the playground, but there are still classes so we need to remember to be quiet. • Work with a partner • When you hear the whistle you need to immediately come and line up to go back inside. • This is not a time to play on the playground equipment. Go through the work packet so the students know what to expect and what to look for when outside on the playground. • Model the documentation page "When I say your name I would like you to quietly grab a pencil and a packet, get your coat and go stand at your table." Have students find partners. Stand by their partners before	**Teaching/Modeling:** Listen to the explanation of the activity and the expectations. Watch the model of the work packet so they understand the activity. Ask any questions if they have them. Students will collect a pencil, packet and their coat before standing in front of their seat. Students will find a partner and then quietly line up.	

	lining up.		
20 min	**Independent Application/ Independent Practice:** Take the students outside to the playground. Carefully monitor the time to ensure that the class returns back inside when necessary. Walk around to the different areas and groups of students to see what they are finding. Be available so that any students who have questions or who make "amazing discoveries" can easily locate you to discuss.	**Independent Application/Independent Practice:** Students will work together to "hunt" around the playground to find insects. They may ask questions or find other groups who have found different insects and ask to be shown the location. Students may ask the teacher questions or want to show the teacher what insects they have discovered. Students will return to the blacktop and line up when the whistle is blown.	
7 min	**Closure/ Sharing:** Bring the students back to the classroom "Boys and girls, what insects did you find? Tell me about your discoveries? What did you learn today?"	**Closure:** Students will walk back to the classroom quietly. Students will share the discoveries they made while participating in the activity outside.	

MEETING VARYING NEEDS/ DIFFERENTIATION:

Student with ADHD

This activity is designed to provide the student with ADHD plenty of time for active movement while still fostering learning in the science field. The student will be allowed to move around the playground area with his peers while still documenting his discoveries. This student also enjoys drawing pictures, which he will be able to do for the majority of the activity (see Bug Hunt handout).

Title One Students (group of 4)

This activity does not rely heavily on any reading so I feel that these students are well supported. If there is ay reading involved they are free to ask a teacher or adult for additional help in understanding. These students will also be working with a partner who can help support them if any reading (of the worksheets for example) is necessary.

Students absent from the previous lesson

For this lesson, students who were absent from the previous lesson should not struggle with the activity itself as a result. For these students I will simply gather them in a small group once we get outside and start the activity and give them any additional information from the previous day that I feel they need to succeed in this activity. I will then use W.I.N. (What I Need most) time to catch the students up and provide a mini-lesson on the previous lessons information.

ASSESSMENT

7. **Evidence collected from this lesson:**

- Discussion of what students have learned in previous lessons
- Bug Hunt worksheet packet
- Discussion of discoveries during the Bug Hunt activity

2. **Dates of formative assessment:**

REFLECTION:

7. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.**

Students did fantastically during this lesson! They were engaged throughout the whole lesson and did a fabulous job following directions and engaging in discovery. Almost all of the students were able to find and discover the required four insects. The few students who did not complete the worksheet were engaged in discovery throughout the whole lesson and simply forgot to document during their discovery. I was able to walk around to all of the students and talk with them about what they were discovering. As a result, I was able to assess student's knowledge/effort even if their documentation was incomplete.

REFLECTION:

2. **Describe any changes you made *as you were teaching* the lesson.**

One change I made prior to teaching was a suggestion from my teacher. Rather than simply allowing students to find ANY insect, I used some prompts to guide them through their discovery. For example, students were asked to look for an insect on a leaf, or flying through the air. This was to simply provide the students with some direction when they went out to go on the "bug hunt".

The only change I made during this lesson was to remove the closure I had planned. I did this because during the discovery portion students were all discussing and sharing their findings with one another naturally. They were excited and engaged, racing from one place to another when their classmates shouted a discovery. I decided to give the students an extra five minutes of discovery rather than complete the closing I had originally planned because the students were already engaging in the discussion naturally.
REFLECTION: **3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.** I truthfully would not change anything about the lesson. It went fantastically well and the students performed amazingly. I could not have asked for the lesson to go better than it did.
REFLECTION: **4. How will the results of this lesson influence the way that you will teach in the future?** I learned that student's blossom and develop a deeper understanding and knowledge when shown real-world application and provided with hands on activities to engage them in learning. I was amazed by how engaged my students were in this lesson and how much enjoyment they had in the activity. Shouts of excitement and discovery could be heard all around the classroom. We walked outside towards the tail end of the recess for second and third grade and even the students who were not in our class but were on recess became interested and helped my class with searching for insects. This is definitely a wonderful lesson and activity that I would use again.

Lesson #8

Date of Lesson: May 11, 2015

HEADING **Lesson Title/Description:** Symmetrical Butterfly Art Project	
Lesson # 8 **of** 10	**Time Allotted for this Lesson:** ~35 minutes
GOALS: **<u>Goal 3:</u>** 1.RI.5 Know and use a various text features (i.e. headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text	**OBJECTIVES:** **<u>Objective 3.2</u>** After a discussion on symmetry in butterflies, students will be using images and knowledge of symmetry to create a symmetrical butterfly art project.

PRE-REQUISITE KNOWLEDGE OR SKILLS:
Students will be using the information they have learned from prior lessons on insects and butterflies to review the life cycle information and discuss symmetry in insects, specifically butterflies. Students will use be using fine motor skills to cut and paste different pieces of tissue paper onto the wax paper that will become the wings of the butterfly.

MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION:

- Wax paper
- Different colored tissue paper
- Liquid Glue mixed with water
- Small plastic containers
- Small paint brushes
- Butterfly cut-outs (25)
- *Butterflies & Caterpillars* by Melvin and Gilda Berger
- 6 Images of butterflies-to show symmetry
- Print out about 10 images of symmetrical and non-symmetrical shapes and insects.

VOCCABULARY INTRODUCED:

- Symmetry

PROCEDURE: ***Teacher Does….***		***Students Do….***	
Time	**Anticipatory Set, Motivation or hook:**	**Anticipatory Set, Motivation or hook:**	
5 min	Read through and discuss several pages of the *Butterflies & Caterpillars* book. • Have students vote on whether each fact is true or false.	Interact with the reading-vote true or false	
	Teaching/Modeling:	**Teaching/Modeling:**	
3 min	"We have been learning a lot about insects. Today we are going to be talking about something that all insects have in common. It is called symmetry. Does anyone know what symmetry means?" "Symmetry means that if we drew a line right down the middle, it would look the same on both sides." Use several students in the	Offer ideas about what they think symmetry is. Look at the different students and determine if they are symmetrical or not symmetrical.	

	class to determine if they are symmetrical. • Be careful to look for the small things! • Even one small difference on one side means that it is not symmetrical		
5 min	**Group Application/ Guided Practice:** Look at some pictures of shapes and insects to determine if they are symmetrical. After practicing introduce the art project. • Making butterflies • Model how to make the wings with the tissue papers, wax paper, and glue mixture. • Your wings need to be symmetrical like we have been talking about! What does symmetry mean again?	**Group Application/ Guided Practice:** As a group look at the different pictures and determine if the shapes or the images are symmetrical. Listen to the directions.	
20 min	**Independent Application/ Independent Practice:** Walk around and help students with their butterfly art project. Make sure that students are using the butterfly images on their tables to make their art projects symmetrical.	**Independent Application/Independent Practice:** Students will be working on their art projects. Students should raise their hands if they need help or are confused about a part of the project. Students will be using the images at their table to remind themselves about making symmetrical butterfly wings.	

2 min	**Closure/ Sharing:** Have students walk around and look at the different butterfly wings every student is making. "Based on the butterflies we see here, do you think all butterflies look the same?" **Students may not complete during this lesson. May possibly need to provide additional time to finish**	**Closure:** Students will talk around and look at the different butterflies all of the students made. Students will respond.	

MEETING VARYING NEEDS/ DIFFERENTIATION:

Students who struggle with fine motor skills

There are several students who struggle with fine motor skills such as cutting and gluing. For these students I will make sure to step in if they appear to be struggling or becoming frustrated with any cutting and gluing they may be doing. The liquid glue mixed with water will be applied with paintbrushes to a large surface area, decreasing the necessity for controlled fine motor skills.

Students who were absent

This lesson does not require students to use information directly from the lesson prior. If students appear to struggle without that information I will make sure to pull them aside and do a quick mini lesson on the previous material. Otherwise the students W.I.N. time will be used to reteach the lesson they missed.

Student with ADHD

The hands-on nature of this activity is a positive design for this student. One thing to keep in mind is to frequently check in with this student in order to ensure that he remains on task and also is using the materials appropriately.

ASSESSMENT

8. **Evidence collected from this lesson:**
    - Students working on their art project through the whole lesson (observation)
    - Finished butterfly art projects
    - Symmetrical Butterfly coloring page

2. **Dates of formative assessment:** May 11, 2015

REFLECTION:

8. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.**

Almost all of my students were able to complete the art project and were successful in meeting the objectives. My clinical teacher suggested adding a coloring page as a formative assessment to see if the students were able to complete a coloring page using symmetry. This was used as additional formative assessment with the art project itself. It was quite difficult to make the butterflies exactly symmetrical with the tissue paper. By adding the coloring page I was able to determine students understanding of symmetry in insects.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

I made very few changes throughout this lesson. I chose to read only about half of the book in the anticipatory set in order to give students more time to work on their art project. I also built the coloring page into the closing rather than having students walk around and look at one another's art projects. Instead, students were able to see everyone's work as it hung on the wire to dry in the back of the classroom. These were the only changes that were made to this lesson plan.

REFLECTION:

3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.

I thought this lesson went very well overall. It definitely helped to have both my clinical teacher and the special education assistant in the room to help with the individual students. The only thing I might add would be a small amount of additional modeling because some students were still confused about the gluing process for the tissue paper. Right before the lesson, my teacher and I decided to glue the wax paper on to the butterfly cutouts and I think this was a smart decision. This helped hold the wax paper stationary, give the students a "field of reference" (gluing paper within the cut-out of the wings) and it also made clean up much easier.

REFLECTION:

4. How will the results of this lesson influence the way that you will teach in the future?

I was able to see the way that art can provide students with a well-rounded educational experience. Students were able to use information they had been learning to create a piece that still targeted their creativity and independence. As a class, we were able to discuss how every butterfly looked unique and slightly different. Students were also able to engage in discussion with their peers. This development of social language is key for all students. This social language development also continued to develop a sense of community within the classroom. While it may be difficult to always fit art into the curricula, I believe that I will try to implement art lessons/activities into my lesson plans occasionally.

Lesson #9

Date of Lesson: May 12, 2015

<table>
<tr><td colspan="3">HEADING
Lesson Title/Description: Parents and Offspring</td></tr>
<tr><td>Lesson # 9 of 10</td><td colspan="2">Time Allotted for this Lesson: 45 minutes</td></tr>
<tr><td>GOALS:

<u>Goal 1:</u>
1.LS.1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.</td><td colspan="2">OBJECTIVES:

<u>Objective 1.1</u>
Following a demonstration of scientific journal observations, students will individually make at least 3 observations, from the suggested checklist, of the live caterpillars/butterflies in their science journals.

<u>Objective 1.4</u>
After a group discussion about the differences between parents and offspring students will complete a Venn Diagram identifying two ways they are similar and two ways they are different.</td></tr>
<tr><td colspan="3">PRE-REQUISITE KNOWLEDGE OR SKILLS:
Students will continue to build on their knowledge from the previous lessons on insects. Students will also need to use their fine motor skills to cut and glue the items within the Venn diagram. Students will also be using the "turn and talk" method with their table groups so they will need to access their knowledge of peer interactions.</td></tr>
<tr><td colspan="3">MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION:
• Waiting for Wings by Lois Ehlert
• Venn Diagrams with word bank (25 copies)
• Sticky Notes
• KWL chart-partially completed
• Pens and Pencils
• Glue
• Plastic bug models (one set for every table)
VOCABULARY USED/INTRODUCED:
• Pupa
• Adult
• Compare & Contrast/Same & Different
• Species</td></tr>
<tr><td>PROCEDURE: Teacher Does….</td><td>Students Do….</td><td></td></tr>
</table>

Time	Anticipatory Set, Motivation or hook:	Anticipatory Set, Motivation or hook:	
7 min	**Gather students on the front carpet** Read *Waiting for Wings* by Lois Ehlert • Who can remind me what the stages of the life cycle are? • What did you notice about what was different between the larva stage ad the adult stage in this book? • How do our caterpillars/butterflies look different now from when we first started looking at them?	Gather on the front carpet Listen to Waiting for Wings Respond to the questions asked. Participate in discussion.	
7 min	**Teaching/Modeling:** "Throughout this week we have learned SO MUCH about insects. I am wondering if you have noticed something though. Do the insects look the same when they are in the larva stage as when they are in the adult stage? What are some of the differences you have noticed? Turn and talk with your groups about the differences you have seen." • Have the students use the plastic insect models to observe "Are there any things that are the same about the larva and the adult? Discuss." • Discuss as a whole class any similarities they found.	**Teaching/Modeling:** Students will inspect the plastic insect modals with their table group and discuss the differences and similarities they notice. They will then share these observations with the whole class.	

5 min	**Group Application/ Guided Practice:** "Do you think that insects are the only thing that look different in the younger stages of the life cycle? Are their other species that look different when younger and older?" What about humans? • Show students a picture of teacher as a baby. • Did I look the same as I do now? • Did I look the same as my mom or dad? • Do I look the same as my mom or dad now? "Has anyone ever told you that you look like your parents?" • May look similar but not exactly the same!	**Group Application/ Guided Practice:** Students will participate in the discussion of similarities and differences between offspring and their parents.	
15 min	**Independent Application/ Independent Practice:** Walk around and monitor the students' progress on the activity. Answer any questions the students may have. Have students come to the back table with their science journals as they finish to make their observations.	**Independent Application/Independent Practice:** Students will work on completing the Venn Diagram activity. As students complete the Venn Diagram activity, have the come to the back table to make their observations of the live caterpillars/butterflies in their science journals.	
2 min	**Closure/ Sharing:** What has stuck with you this week? • Have students write	**Closure:** Students will write down 1-2 things that have "stuck" with them throughout the week and place it on the poster.	

	down 1-2 things they have learned about insects on a sticky note and attach it to the poster up front.		

MEETING VARYING NEEDS/ DIFFERENTIATION:

Students who struggle with fine motor skills

There are several students who struggle with fine motor skills such as cutting and gluing. For these students I will make sure to step in if they appear to be struggling or becoming frustrated with any cutting and gluing they may be doing. The students have used glue sticks many times so they have experience using this medium. If necessary they may ask for help with gluing.

Students who were absent

For these students, the material missed in a previous lesson will be covered during the students W.I.N. time. By reviewing some of the material we have learned this week that is essential for this lesson I feel that the students will be able to complete the activity on their own. They may have additional questions so I will make sure to check-in with these students frequently to eradicate any confusion.

Student with ADHD

For this student I have attempted to utilize hands-on tools such as the plastic insect models. This student will also be engaged in cutting and gluing rather than simply writing the answers on the paper. I will make sure to check-in with this student frequently to ensure that he stays on task and uses the materials appropriately. This student may be part of a small group that is pulled back to a small table to receive some additional focus from an adult in the classroom.

Title One Students

Since the worksheet will be discussed before the students begin I do not foresee any problems for these students with reading the words or directions. Recently we have been coaching students to ask the peers at their table for help reading a word if they are unsure, so the students should utilize this strategy. I will make sure to continually check in with these students to make sure they are able to complete the activity. If I feel that they are struggling to complete the activity due to struggles with reading, I will pull these students to the back of the room to work in a smaller group with an adult.

ASSESSMENT

9. **Evidence collected from this lesson:**

- Completed Venn Diagram
- "L" of KWL chart

2. **Dates of formative assessment:** May 12, 2015

REFLECTION:

9. **How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives**

Almost all students were successful in completing the Venn Diagram activity with 100% success. The students who were not successful will have some additional activities/practice prior to the post-test in order to assist in solidifying the information. Due to time and some changes made to the lesson plan (see below) I did not have students complete the scientific journals for today, therefore the students were unable to meet this standard because they did not engage in the activity.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

Instead of using pictures of myself as a child I had the students look at images of different animals as babies and adults to determine how they were similar and how they were different. Every table group received a different set of images (ducklings and duck, fawn and deer, chicks and chickens, etc.) and discussed the similarities and differences with their table group members. I then asked someone from each group to bring their photos to the document camera and explain to the class the similarities and differences. I felt this was a more effective use of time and allowed the students to make more connections between the similarities and differences of the animals as babies and as adults. This connected very well to our study of insects and I was able to smoothly transition from discussing other animals to discussing insects.

Another change made to the lesson was the closure. Rather than have students complete sticky notes of information that stuck with them, I decided to have the class revisit the KWL chart we have been working on throughout the unit. It had been several days since we had visited the KWL chart and I felt the students needed a chance to share their learning and revisit the information.

I also removed the time in which students would be writing observations in their science journals because I felt that the students needed more time to work on their Venn Diagrams. I plan to make this up by having students make observations in their science journals as one of their language jobs in the next few days.

REFLECTION:

3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.

I thought the turn and talk activity with the different animal pictures was a good activity for the students, however I feel it might have also been more beneficial to look at the pictures as a whole group. Some of the students were not participating in their groups as much as I would have liked, while others lost focus once we began to discuss as a whole class.

REFLECTION:

4. How will the results of this lesson influence the way that you will teach in the future?

I hadn't originally planned to give the students a word bank for the Venn Diagram activity but I changed my mind after several suggestions to do so by my supervisor and clinical teacher. I found the word bank to be very supportive of students learning and demonstration of knowledge. I feel that if students were required to write their own similarities and differences they would have struggled with the activity and it would have taken much longer. By providing the Word Bank I was able to differentiate for students who needed that extra support while also solidifying the information for the students who did not necessarily need that support.

Lesson #10

Date of Lesson: May 14, 2015

HEADING **Lesson Title/Description:** Build an Insect	
Lesson # 10 **of** 10	**Time Allotted for this Lesson:** ~45 minutes
GOALS: **<u>Goal 1:</u>** 1.LS.1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. **<u>Goal 2:</u>** 1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.	**OBJECTIVES:** **<u>Objective 1.1</u>** Following a demonstration of scientific journal observations, students will individually make at least 3 observations, from the suggested checklist, of the live caterpillars/butterflies in their science journals. **<u>Objective 2.2</u>** After modeling how to measure the live caterpillars, students will record at least 5 different length measurements of the live caterpillars in a prepared chart in their science journal.
PRE-REQUISITE KNOWLEDGE OR SKILLS: Students will be utilizing the information they have learned from this unit to create their own bug. They will create a checklist of all the things their insect should have based on this information (i.e. six legs, abdomen, thorax, two eyes, etc.). Students will continue to practice making observations like scientists in their science journals through written observation. Students will continue to develop fine motor skills by coloring, drawing and labeling images. Students will also continue to develop their skills f observation by analyzing the places in the classroom and color a butterfly to camouflage in that area.	

MATERIALS/EQUIPMENT/SUPPLIES/TECHNOLOGY/PREPARATION:

- *How to Hide a Butterfly* by Ruth Hellers
- *Discovering Insects & Spiders* Book, p. 2-3
- Live Caterpillars/Butterflies
- Student Science Journals
- White paper butterflies (25 copies)
- Create Your Own Bug! worksheet
- Student created checklist (Does my Bug Have...)
- Crayons
- Pencils
- KWL Chart

VOCABULARY INTRODUCED/USED:

- Camouflage
- Exoskeleton
- Predators

PROCEDURE: ***Teacher Does….***		***Students Do….***	
Time	**Anticipatory Set, Motivation or hook:** **Gather students on the front carpet** Read *How to Hide a Butterfly* by Ruth Hellers. "Why do you think insects might need to be camouflage? Why would they need to blend in?"	**Anticipatory Set, Motivation or hook:** Gather on the front carpet Listen to the read-aloud. Answer why they think insects might need to camouflage.	
	Teaching/Modeling: "What are some of the things we have learned about insects this week?" "Insects have to protect themselves from many different predators, or enemies. Humans do the same things! What are some ways that humans protect themselves?" • Skin • Helmets • Clothes	**Teaching/Modeling:** State the things they have learned this week. Students will respond with ways that humans protect themselves like insects.	

	• Hair "Insects do the same thing! Insects have an exoskeleton to help protect them from different things like predators or the weather." Show pages 2-3 in *Discovering Insects & Spiders.* "Insects have something called an exoskeleton that protects all of their body parts. Have you ever noticed that if you squish an insect it is sort of crunchy?" "Humans are not the same because out skeletons are on the inside of our body. However, our skin helps protect the parts of our bodies on the inside."	Look at the image in *Discovering Insects & Spiders*	
	Group Application/ Guided Practice: Explain the different stations students will be participating in today (see below). "I want us to come up with a list together of what the insect you create should have. Based on what we know about insects, what should your insect have?" Some ideas include: • 2 eyes • 6 legs • 3 body parts-head, thorax, abdomen • 2 antennae	**Group Application/ Guided Practice:** Listen to the directions for each station. Students will help create the list of what their insect must have to be completed.	
	Independent Application/ Independent Practice: 3 different stations: 1. Butterfly observations and measurements • Students will use their	**Independent Application/Independent Practice:** Students will rotate through the different stations, completing the activity at each station.	

	science journals to record observations of the caterpillars/butterflies . • Students will take measurements of the caterpillars/butterflies 2. Camouflage Butterflies • Students will be choosing an area in the classroom in which they will camouflage their butterfly. Once they have decided how to design the butterfly they will color the butterfly to camouflage as best as possible. 3. Build an Insect • Students will be receiving a "worksheet" to create their own bug. • They must ensure that all parts are included and labeled according to the list we create as a class. • Must be labeled • Share the different insects with the other members of the group as students finish.		
5 min	**Closure/ Sharing:** Gather on the front carpet Finish the KWL Chart • Have students help you finish the "L" portion of the KWL chart.	**Closure:** Gather on the front carpet Students will help complete the KWL chart.	

	• What have we learned about insects this week?		

MEETING VARYING NEEDS/ DIFFERENTIATION:

Student with ADHD

Every station will be approximately 10 minutes. This means that the student will not be required to sit still for long periods of time before moving to the next activity. The fast-paced nature will help to ensure that the student does not become bored and anxious to move. The student also enjoys being creative so two of the three stations tie in directly to something this student enjoys. This will help to keep the student engaged throughout the lesson.

Title One Students

Most of this lesson does not require students to engage in reading activities. The station that may be the trickiest is the station where the students write down observations of the live caterpillars/butterflies. At this station I will ensure that these students receive additional assistance with the recording of their data. At the Build an Insect station an adult can read the checklist to the students to make sure that they have included all of the necessary components.

ASSESSMENT

10. Evidence collected from this lesson:

- Observation of completing their science journals-collected upon completion for formal assessment
- Build an Insect drawings
- Camouflage butterflies

2. Dates of formative assessment: May 14, 2015

REFLECTION:

10. How did the students do re: the objectives and how do you know? Don't forget to comment on your literacy objectives.

Due to changes made to the lesson plan prior to teaching, I would say that my students did not meet the objectives for the lesson. I made changes to the way the lesson ran in general, meaning that students were not able to write down their observations in their science journals or record any measurements in their journals as well. Instead, students will be completing some observations during their morning jobs so that they will continue to practice those skills.

REFLECTION:

2. Describe any changes you made *as you were teaching* the lesson.

About 5-10 minutes before teaching I decided to change how my students completed their activities. I had originally planned to have them rotate through stations, however previous experience with stations demonstrated to me that students would not be able to complete the activities as quickly as necessary for time and they would feel rushed. I made the executive decision to remove the stations and instead have students using all of their knowledge of an insect to "build their own insect". Once students finished with their insect they will be coloring a butterfly to camouflage into somewhere in the

classroom. I feel that this change was extremely beneficial for my students and allowed them to go in greater depth with the activities. By removing the student's science journals from the "rotation" I did not allow students to work towards meeting the objective. Instead, students will be provided with time during their language jobs for recording of their observations.
REFLECTION: **3. What would you change about this lesson plan? Pay attention to situations where students either did not learn or already knew the material.** I think the changes I made to this lesson plan created a lesson that was overall better and a more effective use of time. One major change I would make would be to ensure that I reach the closing of my lesson. Students were highly engaged throughout the lesson and I wish I had been able to connect all of their thinking at the end. I feel that students would have benefited from a short closure activity or discussion that allowed them to connect all of their thinking with the unit as a whole.
REFLECTION: **4. How will the results of this lesson influence the way that you will teach in the future?** I always want to build in stations to lessons because it allows students to complete several activities in a shorter amount of time. However, it is essential to only engage in stations when students will have an adequate amount of time to complete the different activities at each station. This was the main reason I changed my lesson plan today. I felt that students would not have been able to complete the different activities in the amount of time I would have been able to provide. I have learned that sometimes providing fewer activities is better for allowing students to into more depth with the material.

Appendix B

Assessments Used for the Unit of Study

Insect Unit Pre-Assessment

1. Use Unifix cubes to measure the butterfly below. Write your answer on the line next to the picture. (1 point)

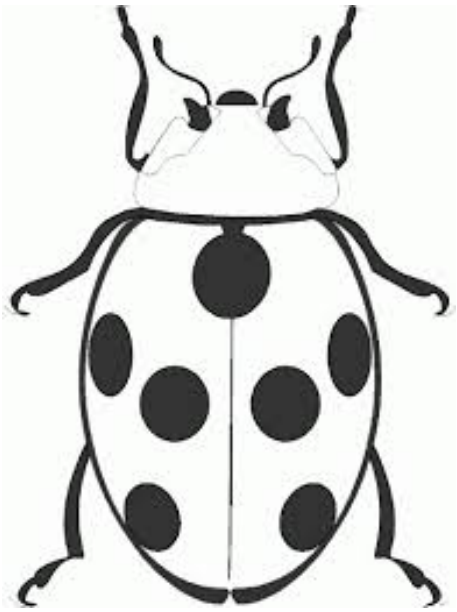
_____

Unifix cubes tall.

2. Read the paragraph below about butterflies. Underline the two sentences that have facts about butterflies. (2 points)

> Butterflies are cute. Butterflies start out as caterpillars before changing to butterflies. They are really cool. When caterpillars change into butterflies they make a chrysalis or cocoon. I think butterflies are awesome.

3. Look at the picture below and read the statements below the picture. Circle the sentences that are true descriptions about the picture. (3 points)



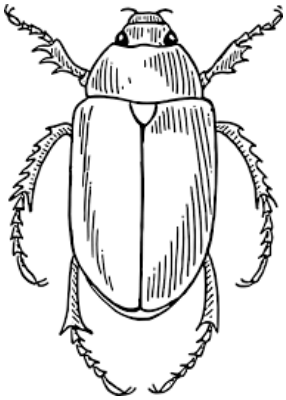
a. The ladybug has black spots.

b. The ladybug is cool.

c. The ladybug has six legs.

d. The ladybug has two antennas.

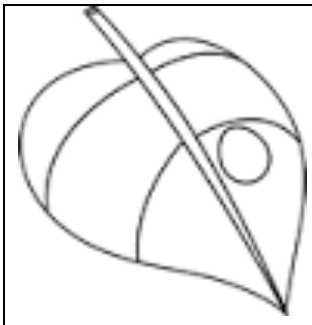
4. Draw the line of symmetry on the two insects below.(2 points)



5. Look at the four pictures below that show the life cycle of a butterfly. In the circle, label the pictures 1-4 according to the order that they happen. Number 1 is the first step of the life cycle and number 4 is the last step of the life cycle. After putting the pictures in order, use the word bank to write down the name of that stage in the life cycle on the line. (8 points)

Word Bank

Eggs **Larva** **Pupa** **Adult**



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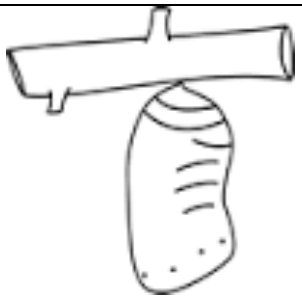

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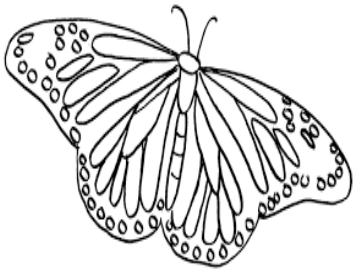
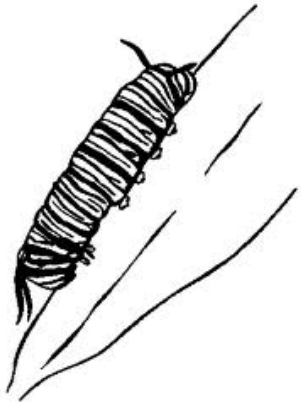
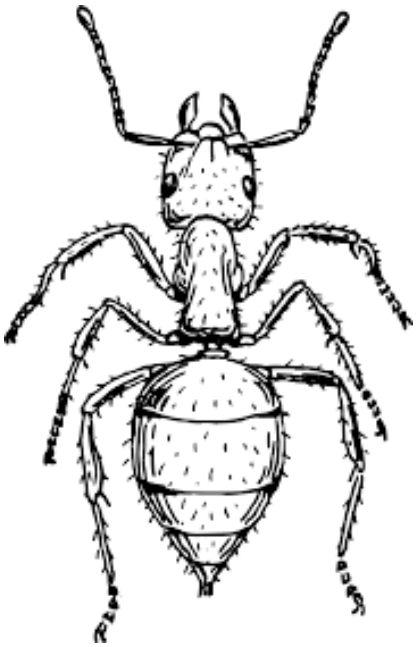


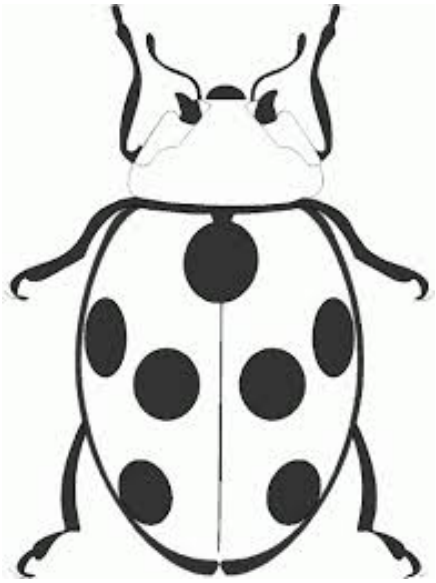
_____



_____

6. Look at the two bugs below and read the statements about them. Circle the sentences that state how the two bugs are similar. (2 points)





a. Both insects have 6 legs.

b. Both insects have spots.

c. Both insects have antenna.

7. Listed below are 3 different measurements of a growing caterpillar that were taken on three different days. Put the measurements in the chart on the correct days. (3 points)

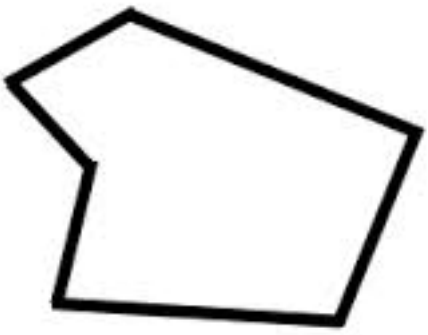
Measurement 1: 5 cm
Measurement 2: 7 cm
Measurement 3: 10 cm

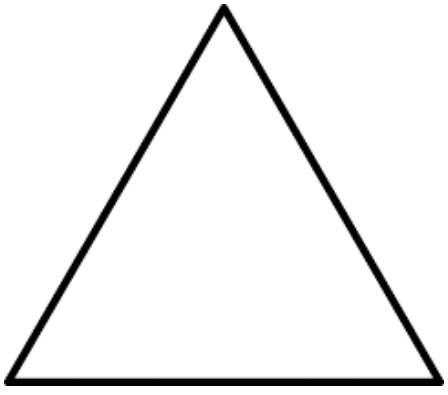
Day Measured	**Measurement (cm)**
Day One	
Day Two	
Day Three	

8. Use Unifix cubes to measure the picture below. Write your answer on the line below the picture. (1 point)

_____Unifix cubes long.

9. Which picture does not have symmetry? Circle the correct answer. (1 point)





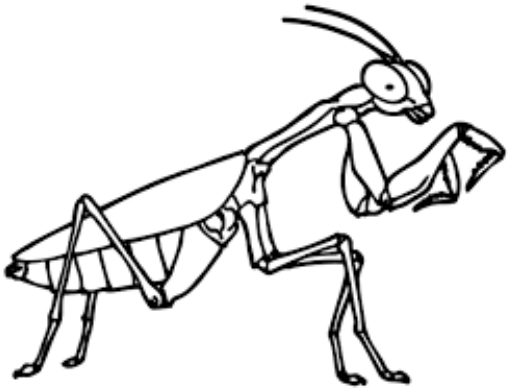
10. Read the paragraph below. Underline the two sentences that are good facts to use in an informational text about an ant. (2 points)

Many people think ants are annoying. There are more than 20,000 species of ants in the world! Ants are cool insects. Typically ants live in large colonies or anthills.

11. Look at the picture of the insect. Use the picture to help you fill in the blanks. (4 points)

Work Bank

two **antennae** **legs** **wings**



a. The praying mantis has six _____.

b. The insect has two _____and two _____.

c. A praying mantis has _____ large eyes.

Insect Unit Post-Assessment

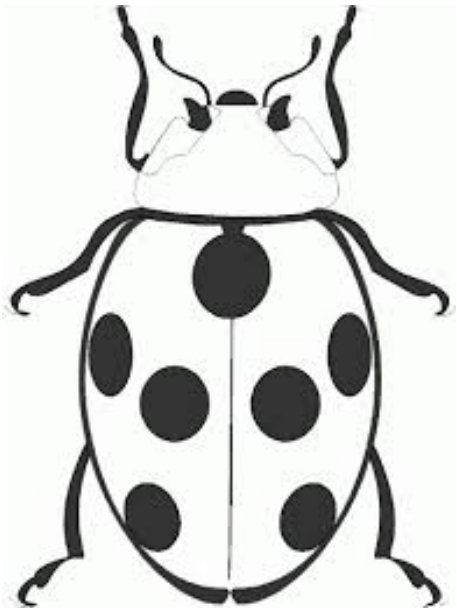
1. Use a ruler to measure the butterfly below. Write your answer on the line next to the picture. (1 point)

_____ **inches tall.**

2. Read the paragraph below about butterflies. Underline the two sentences that have facts about butterflies. (2 points)

> Butterflies are cute. Butterflies start out as caterpillars before changing to butterflies. They are really cool. When caterpillars change into butterflies they make a chrysalis or cocoon. I think butterflies are awesome.

3. Look at the picture below and read the statements below the picture. Circle the sentences that are true descriptions about the picture. (3 points)



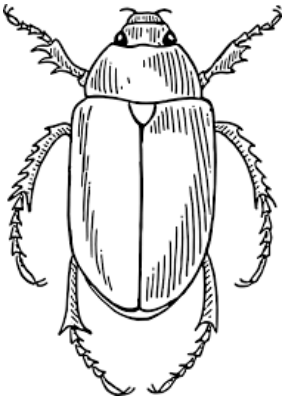
a. The ladybug has black spots.

b. The ladybug is cool.

c. The ladybug has six legs.

d. The ladybug has two antennas.

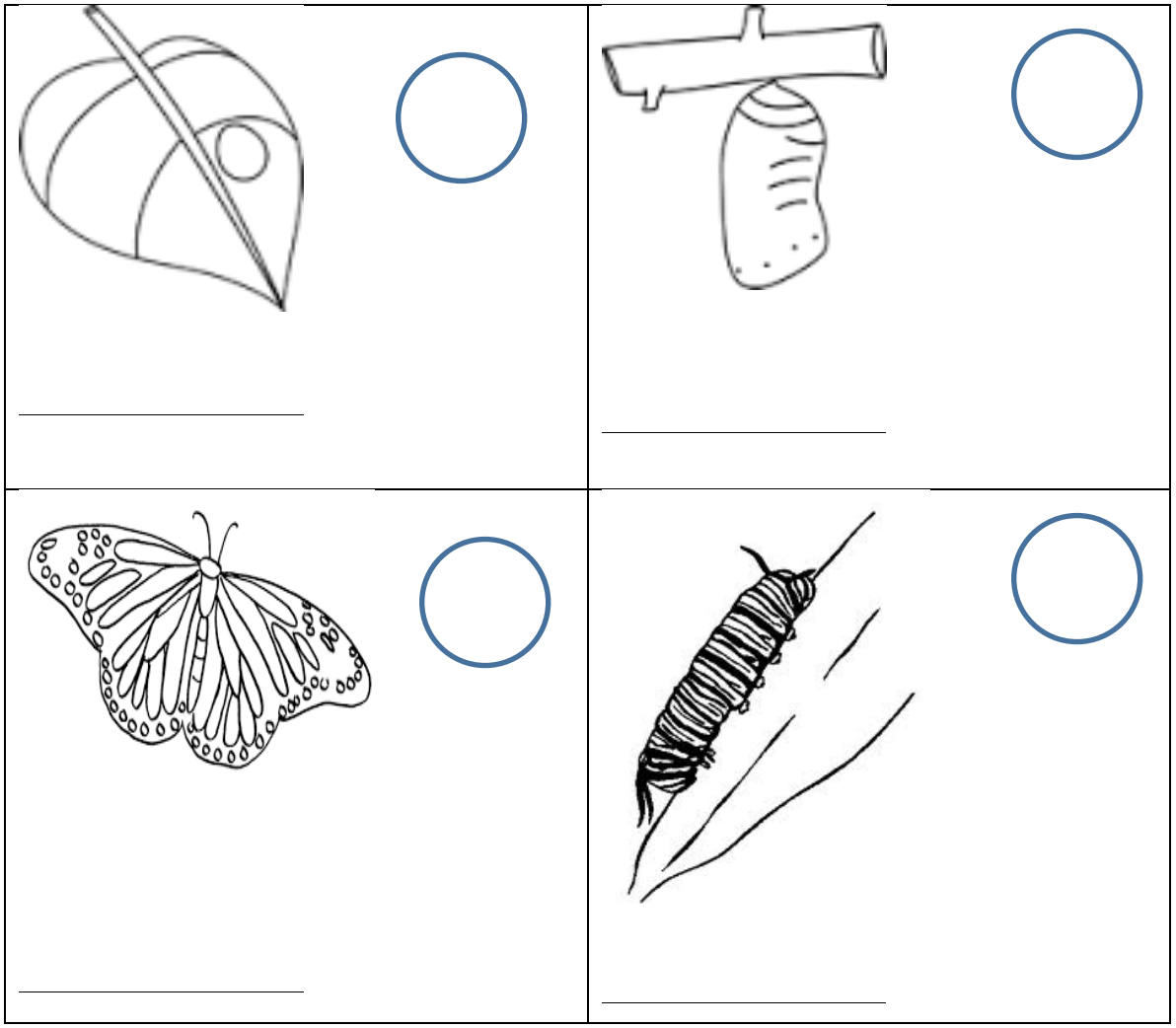
4. Draw the line of symmetry on the two insects below.(2 points)



5. Look at the four pictures below that show the life cycle of a butterfly. In the circle, label the pictures 1-4 according to the order that they happen. Number 1 is the first step of the life cycle and number 4 is the last step of the life cycle. After putting the pictures in order, use the word bank to write down the name of that stage in the life cycle on the line. (8 points)

Word Bank

Eggs **Larva** **Pupa** **Adult**



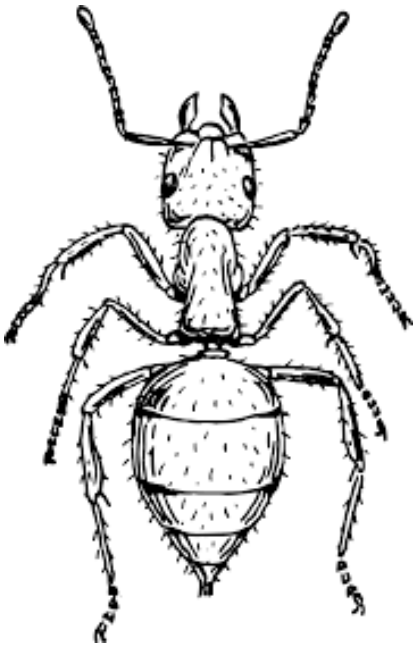
_____

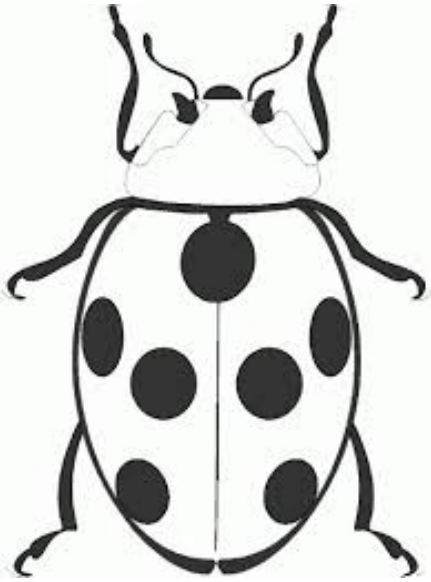
_____

_____

_____

6. Look at the two bugs below and read the statements about them. Circle the sentences that state how the two bugs are similar. (2 points)





a. Both insects have 6 legs.

b. Both insects have spots.

c. Both insects have antenna.

7. Listed below are 3 different measurements of a growing caterpillar that were taken on three different days. Put the measurements in the chart on the correct days. (3 points)

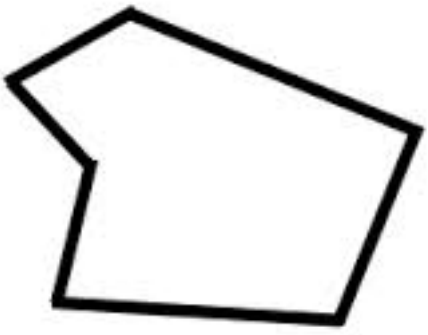
Measurement 1 is 5 cm
Measurement 2 is 7 cm
Measurement 3 is 10 cm

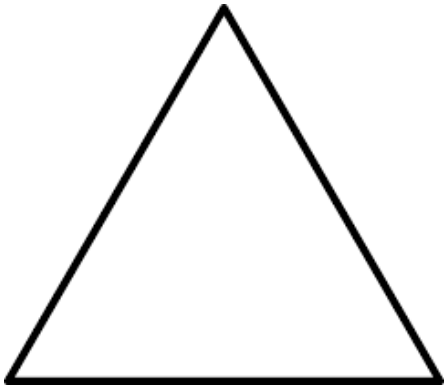
Day Measured	**Measurement (cm)**
Day One	
Day Two	
Day Three	

8. Use a ruler to measure the picture below. Write your answer on the line below the picture. (1 point)

_____inches long.

9. Which picture does not have symmetry? Circle the correct answer. (1 point)





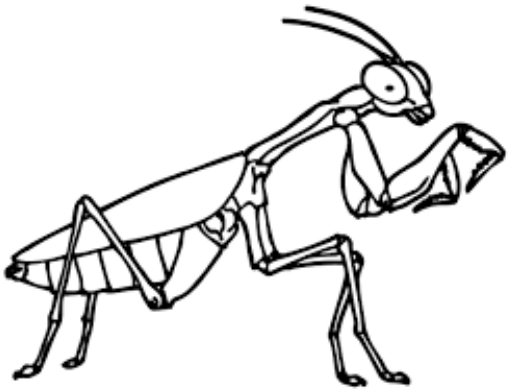
10. Read the paragraph below. Underline the two sentences that are good facts to use in an informational text about an ant. (2 points)

Many people think ants are annoying. There are more than 20,000 species of ants in the world! Ants are cool insects. Typically ants live in large colonies or anthills.

11. Look at the picture of the insect. Use the picture to help you fill in the blanks. (4 points)

Work Bank

two **antennae** **legs** **wings**



a. The praying mantis has six _____.

b. The insect has two _____and two _____.

c. A praying mantis has _____ large eyes.

Appendix C

Included below is more information regarding the interview process used for this study. Additionally, the transcriptions of the interviews conducted with the students participating in this research study are included as well as the consent form parents signed.

Interview Information

Prior to conducting the interviews with the individual students I received consent from the students parents via a parent consent form. On this form parents consented to allow their students to participate in a recorded interview.

Once I received consent from the parents, I pulled each student aside individually in a private area to conduct the short interview. Prior to engaging in the interview with the students I presented them with a student-friendly consent form in order to explain what the purpose of the interview was and to receive their consent as participants as well. Due to the reading ability level of the students I was interviewing, I made sure to read the consent form to them while it was on the table in front of them, allowing them to follow along. After reading the student-friendly consent form to the student and asking if they had any additional questions, the students and myself signed the consent form. The students we then ready to participate in the interview process.

In order to protect the students participating the in interview process, they have been randomly assigned a number which can be found at the top of page with their transcribed interviews. These numbers will be used throughout the analysis when referencing any particular words or any specific analysis of the students' responses.

The pages that follow contain transcribed versions of each interview conducted with the five students in this study. Students were interviewed prior to the beginning of the science unit on April 30th and were interviewed after the completion of the unit on June 1st. The first interview contained 4 original questions, with some questions having two parts (i.e. one positive and one negative experience). However, some additional questions were added throughout the interviews to clarify or prompt the students to answer with or provide more details. In order to ensure understanding of the original questions, these original questions have been underlined in every transcription so the reader can better understand when questions were added for clarification or prompting purposes.

The second interview contained the four original questions with the addition of a fifth question that related more directly to the material studied in the science unit. The questions have also been underlined in the transcriptions of the second interviews.

Parent Consent Form

Primary Researcher: Mary Rice
Email: mrice10@wou.edu
Phone Number: 541-390-0298
Faculty Advisor: Marcus Wenzel
Email: wenzelm@wou.edu
Phone Number: 503-838-9125
Mailing Address: Marcus Wenzel, College of Education, 345 Monmouth Ave, Monmouth OR 97361

Parent Consent Form for Student Participation in Research Interviews

I am conducting a study of experiential education in order to observe how hands-on learning influences student enjoyment and knowledge retention in the subject of science. Mrs. Fagin's classroom will be the site of this study. I hope that you will agree to allow your child to participate in the study.

The aim of this study is to examine how experiential education, founded by John Dewey in the 1890's, can impact students in modern day classrooms. Experiential education focuses on hands-on, inquiry-based learning experiences. This study is meant to be the foundation for further exploration and discussion on the important effects that teaching through this theoretical framework can have on students in the 21st century. This study will help to provide data for the discussion on education and development of curricula based on the collected data. As I complete this study, I am interested in interviewing some of the students about their experiences in science education. The individuals in this study will benefit by knowing that they are contributing to educational framework development as well as being exposed to a different style of teaching and learning that may be more beneficial and fitting for them.

These interviews will be carried out from April through June 2015 and will take place during the school day in the pull-out area in the halls. The interviews will be conducted between 10:30 and 11:00 AM so that the interviews will not interfere with your child's content-area learning, specials (i.e. P.E. and library), recess, or lunch. During this time students are attending W.I.N. (What I Need Most) time in which they receive additional intervention in a variety of subject areas, additional time to complete work, and a variety of different activities. During this W.I.N. time the interviews will occur. Students participating in the interviews will only be engaged in the interviews for a maximum of 5 minutes. Additionally, these interviews will be conducted with the knowledge of the teacher and the school administration.

Interviews will be digitally recorded and transcribed on a secure laptop computer. Any hard copies of the interviews will be stored in a locked and secured location. No one outside of the Western Oregon University researchers involved in this project will have access to the information present in these interviews.

Participation in these interviews is voluntary. Parents/guardians and the students will decide if the student will participate in the interviews. If the student and parent/guardian initially agree to the interview but change their minds later on, the student is under no obligation to continue with the interviews. Participation in the interviews will not affect the student's grade in any way. On the other hand, there is no penalty for not participating. If the student does participate in the interviews they will not be identified by name in any research reports and their confidentiality will be protected to the maximum extent allowable by law. When referring to collected data, student information will be conveyed through an assigned number that is in no way connected to the students outside of the research study. The master list for this number system will be stored in a locked and secured location and will be destroyed upon completion of the research project. All

data collected in this research study will be deleted within 5 years of the completion of the project.

Although it is not anticipated, students may feel stressed or uncomfortable participating in the interview. If the participant is feeling stressed or is uncomfortable with being recorded for their interview they may opt to have their answers recorded via pencil and paper. If students are still uncomfortable with the interview they may opt out of being interviewed at any time and all of their data will be permanently deleted. If they still feel uncomfortable or stressed after the interview, I will direct them to the Lyle Elementary guidance counselor.

If you would like any additional information regarding this research project or any additional questions you may contact me, Mary Rice, at mrice10@wou.edu, or my faculty advisor, Marcus Wenzel, at wenzelm@wou.edu. If you have any questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact, anonymously if you wish, Dr. Jeff Armstrong, Western Oregon University Instructional Review Board: (503) 838-8999, email: irb@wou.edu, or regular mail: NPE #203, Monmouth Oregon, 97361

I agree that my student (_____) may participate in the interviews piece of this research project. I am free to discontinue his/her participation in these interviews at any time.

_____	_____	_____
Print name of parent/guardian	Signature of parent/guardian	Date

I agree to participate in the interview piece of this research project. I may stop participating in these interviews at any time.

_____

Print Name of Student Here

_____	_____
Student Signature	Date

_____	_____	_____
Print Name of Researcher here	Researcher Signature	Date

Student Consent Form

Primary Researcher: Mary Rice
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Student Friendly Form: To be read verbally to students.

Learning about Science!

What is the project?

- To help Miss Rice make learning science fun and to have students talk about why they *do* or *do not* like science, how they use science outside of the school, and how they learn best.

What do I have to do?

- Do a recorded interview, or talk about, science to Miss Rice two (2) different times--once in April and once in June!

What will happen with my interview?

- The interview will be stored in a safe place, and Miss Rice will write down what you tell her. Your answers might be used in the project, but under a random number so you will be safe!

What are the benefits and risks?

- The benefits are that you will be helping to add knowledge for teachers everywhere on how we can teach you best.
- The risks are you might feel uncomfortable/stressed during the interviews. If you feel this way, tell Miss Rice and she will interview you with paper and a pencil instead or stop the interview. If you keep feeling this way, Miss Rice will help you set up an appointment with the guidance counselor.

Will I get anything if I participate?

- Not this time!

What if I change my mind?

- You can change your mind at any time! If you change your mind I will delete everything to do with your interview.

I agree to be interviewed. I may stop participating in these interviews at any time.

_____ _____
Student name here Date

_____ _____ _____

#5

Interview 1- April 30, 2015

Interviewer: So...do you think it is important to learn science?
5: Yes
Interviewer: Yeah, why?
5: You can make stuff
Interviewer: Like what?
5: Bubbles
Interviewer: Bubbles...have you made bubbles in science before?
5: Uh-huh
Interviewer: Really?
5: Uh-huh
Interviewer: When did you do science?
5: So we had like a little straw and then we blow.
Interviewer: Oh and then you blow into in right? With air? Like this...(demonstrates blowing into a straw)
5: Yeah
Interviewer: Alright...very cool. What is one thing you really like about science?
5: That we get to blow bubbles.
Interviewer: Have you done anything else?
5: Ummm...no
Interviewer: Do you think it's fun?
5: Yes!
Interviewer: What is one thing you really dislike about science? So, one thing you don't really like about science.
5: That it gets all over my shirt.
Interviewer: The bubbles?
5: Uh-huh
Interviewer: Do you think you are good at science?
5: Yes.
Interviewer: Yeah...why?
5: Because I blow bubbles!
Interviewer: What is one positive experience you had had learning science in school? So, what is one good experience you have had learning science in school?
5: Umm...I don't know.
Interviewer: Have you had any...have you learned science in school?
5: Yup!
Interviewer: Like what? The bubbles?
5: Uh-huh
Interviewer: Cool! Was that a good experience?
5: Yup!

Interviewer: Have you done anything else in school with science?
5: umm...playing
Interviewer: With what?
5: With toys.
Interviewer: Like science toys?
5: No
Interviewer: No..just playing with toys...ok. What is one negative experience you have had learning science in school?
5:Umm...
Interviewer: So one bad experience.
5: I do not know
Interviewer: Do you think some of your answers will change next time?
5: Yes.

#5

Interview 2- June 1, 2015

Interviewer: Do you think it is important to learn science?
5: Yes
Interviewer: Why?
5: Because you can learn different stuff
Interviewer: Like what?
5: Blowing bubbles.
Interviewer: Ok...alright. What is one thing you really like about science?
5: It's cool
Interviewer: Ok...what is one thing you really dislike about science? Or don't like? It means the same thing.
5: That is gets on the ground
Interviewer: What gets on the ground?
5: The bubbles
Interviewer: Ok...are bubbles the only thing we do in science?
5: No...
Interviewer: Ok...so what's one thing you don't like about science?
5: ...It's sticky.
Interviewer: Ok...remember science is more than just about bubbles so try to keep that in mind. Do you think you're good at science?
5: Yes.
Interviewer: Why?
5: I make stuff
Interviewer: Ok...What is one positive experience you have had learning science in school? Positive means good.
5: ...(no response)
Interviewer: What's one good experience you have had learning science in school?
5: I don't know
Interviewer: You don't know? That's ok. What's one bad experience you have had learning science in school.
5: Uhh...ummm...Still don't know.

Interviewer: Ok. Did learning about insects make you more interested in science?
5: Yes.
Interviewer: Ok, how?
5: Because they are small.
Interviewer: Anything else?
5: Nope
Interviewer: Ok.

#10

Interview 1- April 30, 2015

Interviewer: So my first question is, do you think it is important to learn science?
10: Yeah
Interviewer: Yeah...Why?
10: Because there is something that you might not know that you need to know.
Interviewer: Ok, can you give me examples?
10:... (no response)
Interviewer: If not, that's ok.
10: No
Interviewer: No, ok. What is one thing you really like about science?
10: That like there's cool stuff that you can do.
Interviewer: Have you done any science in the past?
10: Yeah
Interviewer: Like what?
10: Like making a little thing to make..like to make light...
Interviewer: To make light?
10: ...look really cool. There's a bunch of mirrors in it.
Interviewer: Oh cool, I have never done that.
10: There's tape on it, and you write on it. I did it in Kids in Science.
Interviewer: Kids in Science? Did you do that this year?
10: Yeah
Interviewer: Are you doing that? Is it still going? Or is it over? I saw when you guys got the paper...
10: I did it and then..umm...they just kind of stopped and then now they're doing it again.
Interviewer: Oh ok. Alright, my next question is what is one thing you don't like about science?
10: That like..umm..the light might get...umm...to...umm...too much light.
Interviewer: So when something doesn't work?
10: Yeah
Interviewer: That's kind of frustrating, right?
10: Yeah
Interviewer: Do you think you're good at science?
10: Yeah
Interviewer: Do you like doing experiments?
10: Yup
Interviewer: What is one positive experience you have had learning science in school?

So positive means like a good experience.
10: Making a kind of goo
Interviewer: A what?
10: A kind of slime
Interviewer: Oh it was slime? What color was it?
10: Green
Interviewer: Green...Was it really slimy? Did it bounce?
10: Yeah
Interviewer: That's pretty cool. What did you guys make that for?
10: Umm...Just for fun.
Interviewer: Yeah...What class did you make it in?
10: Umm like the class...character education*.
Interviewer: Oh ok...very cool. And have you had any negative experiences with doing science?
10: No, because all of it worked. The little mirror thing, there would be...umm...it would make it look like there was a bunch of lights when there was really only one light.
Interviewer: Was it kind of like a disco ball? Kind of looking? Do you know what a disco ball is?
10: Yeah
Interviewer: Did it kind of look like that?
10: Umm...It kind of made it look like that because there was like three mirrors and little tiny mirrors inside it
Interviewer: Very cool. Were they different colors when it reflected? Or was it all just the same color?
10: They were all the same.
Interviewer: Very cool.
10: I just got to color on the tape on the front.

*During the interview the students simply named the teacher whose class they created the slime in. In order to allow this teacher and all other members of the study to remain anonymous I have replaced the student's answer with the appropriate special the student was in with that teacher.

After completing this interview, the interview process was stopped with this student. The student was removed from the classroom for three weeks for family emergency purposes and only received/attended two of the lessons in the science unit. As a result of this absence I removed him from the second set of interviews because he was not present for the lessons.

#12

Interview 1- April 30, 2015

Interviewer: Do you think it is important to learn science?
12: Yeah
Interviewer: Yeah...Why?
12: ... (no response)
Interviewer: Why would it be important to learn science?
12: ...uhhh
Interviewer: Do you have any ideas?
12: (shakes head to indicate no)
Interviewer: No? Ok. What is one thing you really like about science?
12: That you can make...that you can make cool stuff
Interviewer: You can make cool stuff? Have you ever made anything cool doing science?
12: ...(no response)
Interviewer: Have you done any science experiments?
12: No
Interviewer: No, that's ok! What is one thing you don't like about science?
12:...uhhh...
Interviewer: There is no wrong answer; I just want to know what you think.
12: ....Uhhh...
Interviewer: We can come back to that one if you want.
12: Ok
Interviewer: Ok. Do you think you're good at science?
12: No
Interviewer: No? Why not?
12: Because I have never done it before.
Interviewer: Because you have never done it before. OK. What is one positive experience you have had learning science in school? Positive is another word for good, right? So what is a good experience you have had learning science in school?
12: ...That you get to learn other stuff about science.
Interviewer: What is a negative experience you have had learning science in school? Negative is like a bad experience.
12: ...ummm...that nobody helps you.
Interviewer: You don't like when nobody helps you?
12: Yeah
Interviewer: Does that make it hard?
12: Yeah
Interviewer: Do you think science is hard to learn?
12: Yeah
Interviewer: Ok can we go back to that question we skipped? (Student indicates yes). Ok. What is one thing you really dislike about science? One thing you really don't like?
12: If you get it wrong, you get like...
Interviewer: What happens if you get it wrong?
12: If you get it wrong, you...can umm...not get it right.

#12

Interview 2- June 1, 2015

Interviewer: Alright, so my first question is: do you think it is important to learn science?
12: Yes
Interviewer: Why?
12: Because you can learn cool stuff
Interviewer: Can you give me an example?
12: ...umm...
Interviewer: It's ok if you can't, I just wanted to check. What is one thing you really like about science?
12: That you can..umm... learn new stuff.
Interviewer: Ok. What is one thing you really dislike about science? Or don't like?
12: That you can't play.
Interviewer: You can't play...it's pretty serious right?
12: Yeah
Interviewer: Do you think you are good at science?
12: ...Yes
Interviewer: Ok, why? What makes you think you are good at science?
12: Uhh...I don't know
Interviewer: Well why do you think you are good at it?
12: Because umm....
Interviewer: Not sure? (Student indicates they are unsure) Ok. What is one positive experience you have had learning science in school? Positive means good.
12: Uhhh...that you can make stuff.
Interviewer: Can you give me an example?
12: ...umm...(no response)
Interviewer: What is one negative experience you have had learning science in school? Negative means bad.
12: That...you can maybe get in trouble if you do the wrong thing.
Interviewer: Ok. Did learning about insects make you more interested in science?
12: Yes
Interviewer: How?
12: Because it is cool.
Interviewer: What was your favorite thing you learned about insects?
12: Umm...That you can make stuff.

#17

Interview 1- April 30, 2015

Interviewer: So, do you think it is important to learn science?
17: ...yes
Interviewer: Why?
17: Because you get to learn stuff that you don't know.
Interviewer: Ok. Like what?
17: I don't know.
Interviewer: Ok, that's alright. What is one thing you really like about science?
17: Umm...I don't know because I have never done it.
Interviewer: You haven't done any science?
17: No
Interviewer: Ok. Have you done science in school?
17: No.
Interviewer: Not outside of school either?
17: No
Interviewer: Ok. Do you think you're good at science? Do you think you would be good at science?
17: No
Interviewer: Why not?
17: Because I haven't learned about science yet.
Interviewer: Ok. So, what is one positive experience you have had learning in science? Have you ever done a science experiment?
17: No.
Interviewer: No? So you don't have any positive or negative experiences
17: No
Interviewer: If you could learn one thing in science what would it be?
17: I don't know
Interviewer: You're not sure? That's ok.

#17

Interview 2- June 1, 2015

Interviewer: Do you think it is important to learn science?
17: Yes!
Interviewer: Why?
17: Because you get to learn different things about things what do in science.
Interviewer: You get to learn about different things in science?
17: Yes
Interviewer: What is one thing you really like about science?
17: Umm...I don't know...that you get to learn different things.
Interviewer: Can you give me an example?

17: Umm...Because you get to learn about bugs.
Interviewer: Ok. What is one thing you really dislike about science?
17: Umm...
Interviewer: One thing you really don't like.
17: Umm...nothing.
Interviewer: You don't dislike anything?
17: No
Interviewer: Do you think you're good at science?
17: Yeah
Interviewer: Why?
17: Because I kind of know what to do.
Interviewer: What is one positive experience you have had learning science in school?
17: Umm...
Interviewer: Positive means good, right? So what is one good experience you have had learning science in school?
17: I don't know.
Interviewer: Can you think of any?
17: No.
Interviewer: What is one negative experience you have had learning science in school?
17: Umm...
Interviewer: Negative means like bad kind of.
17: ...ummm...ummm...I don't know.
Interviewer: Nothing? Can't think of anything?
17: No
Interviewer: Did learning about insects make you more interested in science?
17: Yeah
Interviewer: How?
17: Because I got to learn different things I didn't know about bugs and insects.
Interviewer: What was one of your favorite things that you learned?
17: That now I know that insects have six legs and butterflies have two pairs of wings.

#25

Interview 1- April 30, 2015

Interviewer: Do you think it is important to learn science?
25: Yes
Interviewer: Why?
25: Because it helps with math.
Interviewer: You think it helps you with math? Ok. Any other reasons?
25: It helps your brain to get smart.
Interviewer: What is one thing you really like about science?
25: You always get to...get to do stuff.
Interviewer: Like what?
25: Like you get to do experiments and stuff...You can do stuff about it, and you can make stuff up sometimes...And sometimes in math and science sometimes they're the

same...like sometimes they're different...like science is about other stuff...and the other thing about science is there is more stuff...but sometimes you want to be smart and not...your brain doesn't want to be dumb, it wants to be smart, really smart.
Interviewer: Nobody is dumb though right? We are all smart.
25: Yeah
Interviewer: What is one thing you dislike about science? What do you not like about science?
25: Umm...spilling stuff onto something and it turns something into whatever it made...and how did you destroy it and stuff...and sometimes I don't like science but I want to get smart, really smart. I don't want to be like those kids that just sit around and watch T.V. and just do stuff a lot. I want to be a smart kid, a really smart kid....but sometimes I don't like something in science.
Interviewer: Like what?
25: Umm..making...how do you destroy the stuff you make and doing stuff you don't want to do and just stuff...kids tell you what to do to other kids...I don't want to be like those mean kids. I just want to be...I just want to be a smart kid
Interviewer: Do you think you're good at science?
25: A little bit. Because I never did science. I was telling my mom I want to do science in my garage
Interviewer: In your garage?
25: Yup
Interviewer: What did she say?
25: I think she said maybe.
Interviewer: What is one positive experience you have had learning science at school? So what is one good experience you have had learning science at school?
25: Umm..counting by 10's.
Interviewer: Was that science or math?
25: Math...but that helps you sometimes.
Interviewer: Have you done science in school?
25: No, I never did science. But at my old school, other kids got...sometimes they got to do science, but not me. I never got to do science, ever because the other kids just got to do science because...I don't know why they got to do science and not me. But some of the kids never got to do science...some kids didn't and some kids did.
Interviewer: What is one negative experience you have had learning science in school? What is a bad experience you have had learning science?
25: Ummm...I say something on Goosebumps and this thing...this thing came...the dad was making experiments and there was a big fish and something dropped in the water and made the fish big and threw spikes.

#25

Interview 2- June 1, 2015

Interviewer: Do you think it is important to learn science?
25: Yes
Interviewer: Why?

25: Uhh...because it helps you with math and you can do fun stuff with it sometimes...and you can get smarter...I think one more thing...
Interviewer: Ok what else? What is that one last thing?
25: Umm...doing science is sometimes fun and stuff...you get to make stuff and do other things....and do really, really fun things if you do science.
Interviewer: What is one thing you really like about science?
25:Umm...you can make stuff with stuff.
Interviewer: What is one thing you really dislike about science? Dislike means you don't like it.
25: Sometimes you make something...sometimes you make something and it's the wrong thing to make and it turns into something and then it tries to eat you...that's what I do not like about science
Interviewer: Do you think you are good at science?
25: Yeah
Interviewer: Why?
25: Umm...my mom said she would help me with science...but I never did...never, ever did something about science but I did one thing...you know what I did? You know those goo things?
Interviewer: Like flubber?
25: Yeah...I have some and I mixed them together and they make...I had orange, blue, and green...and it changed into green but it was big but when you mix it in water it makes it really slimy and stuff. But it was fun...it was like wet.
Interviewer: What is one positive experience you have had learning science in school? Positive means good.
25: Ummm...I don't know.
Interviewer: What is one negative experience you have had learning science in school? Negative means bad.
25: Umm...hmm...I think I know about it but it is really hard for me to think...
Interviewer: Did learning about insects make you more interested in science?
25: Insects are good...they change...first they start out at an egg, then a caterpillar, then a butterfly...wait...actually chrysalis, then a butterfly.
Interviewer: Ok, but did learning about insects make you more interested in science?
25: Yes
Interviewer: Yes, why or how?
25: Because they change into stuff when they are growing, growing, growing
Interviewer: Anything else?
25: Umm...let me think...umm...bugs are interesting. They always start out as something first and then they grow... then they change into and adult after those three things... then when they are an adult they have antennas, wings, and six legs.

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