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## The Effects of an Elementary After-School Enrichment Program on Gifted and Talented Students' Attitudes Toward School

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The Effects of an Elementary After-School Enrichment Program on Gifted and Talented  
Students' Attitudes Toward School

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## EFFECTS OF AFTER-SCHOOL ENRICHMENT

### Abstract

The study researches interest-based learning in a controlled setting in order to gain insight into student attitudes toward school, more specifically among identified gifted and talented students. This study poses the research question, "Does an after-school program designed to cater to student needs affect student attitudes toward school?" This was an action research study using pre and post assessments to determine elementary students' attitudes toward school. The study was conducted at an after-school program, once a week for ten weeks total. There were ten students involved in the study, with three of them being formally identified through the school district as "gifted and talented." Of these participants, nine of them were females and one was male. Students ranged in grade from 2<sup>nd</sup> to 5<sup>th</sup> grade. Student interviews were conducted with a random selection of students after the conclusion of the intervention enrichment cluster to support data and findings. The results of the study were statistically significant; students declined from pre to post survey. However, through qualitative data and other data collection methods apart from the numerically scored surveys, it was observed that the students who participated in the study do have positive attitudes toward school. Students did enjoy learning about concepts, topics, and ideas in which they were interested. Interest-based activities have a substantial place in the academic culture.

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## **Chapter I**

### **Introduction**

School is often thought of as a place of learning, in which rigorous activities occur that involve students' active participation throughout the day, during a set time period. Once the traditional school day is over, however, learning and development can and does still take place. After-school programming plays a vital part in educational society, especially for, but not limited to, children of low-income backgrounds. Research has shown that "more than 2 hours of unsupervised time has a substantial detrimental effect on internalizing and externalizing problems in elementary school-aged children who are at high risk for inattention and problem behaviors" (Na, et al., 2013, p. 1126). After-school programming provides a specific and consistent environment for students to attend when the traditional school day is over.

For the purpose of this study, after-school programming is defined as: "structured programs supervised by adults and operate after school during the school year" (Kremer, Maynard, Polanin, Vaughn, & Sarteschi, 2014, p. 616). The same study that defined after-school programming also stated, "Billions of private and public dollars are spent annually to operate approximately 50,000 public elementary school and additional middle and high school programs across the United States" (Kremer, et al., 2014, p. 616). Given the large sum of money being spent on operating after-school programs, it is logical to assume that everyone would believe they should work to be developed into effective programs for the attending students.

Through this study, an evaluation of an academic enrichment after school program was conducted. The premise of this evaluation centered on the belief that academic

enrichment outside of the traditional school setting, would improve students' attitudes toward school, and students' parents would notice a difference in attitude as well. This belief was supported by researchers Grogan, Henrich & Melina (2014) who stated, "It is possible that engagement in school-based after school programs may translate more directly to improved performance and behavior in the classroom during the school day" (p. 7). The purpose of this thesis project was to expose students to creative and problem solving skills through outside of school academic enrichment.

### **Statement of the Problem**

Often students, specifically those who are gifted and talented from low-income backgrounds or minorities, lack in academic enrichment, whether inside or outside of the daily school routine (Stambaugh & Ford, 2015). According to Stambaugh and Ford, "Gifted students' success is less optimal when their economic, cultural, socioeconomical, affective, and developmental needs are ignored, trivialized, or poorly addressed" (2015, p. 192). The researcher aims to address academic needs of gifted students who are of a minority or low-income background. The study aims to provide an opportunity for these specific students to experience quality academic programming outside of the traditional school setting. According to research (Gross, 2008) gifted students "require highly individualized educational planning," because "the range of abilities among the highly gifted is enormous" (p. 248). Because of this need for differentiation, when gifted and talented students do not receive it, it aids in their developing an underachieving mindset. Without challenge, gifted and talented students are essentially bored. Sometimes, this can change their attitudes toward school. The researcher believes that if given the proper tools, students who receive

enrichment out of the typical school setting will begin to shift their attitudes towards school. It has been recognized that “gifted children, especially the most highly talented, often need specialized counseling services to deal with psychological problems related to their giftedness and actualize their potential” (Peterson, 2008, p. 119). It is evident that gifted students need highly individualized plans to aid them in realizing potential and growth. Education professionals need to, first of all, recognize the traits of a gifted and talented student, and also differentiate their instruction. The researcher believes that if instructional needs are met, gifted and talented students will be less likely to experience feelings of dislike for school and learning activities.

### **Definition of Terms**

For the understanding of this study, the following terms are defined:

1. Gifted and talented is defined by the state of Arkansas as youth of “high potential or ability whose learning characteristics and educational needs require qualitatively differentiated educational experiences and/or services. Possession of these talents and gifts, or the potential for their development, will be evidenced through an interaction of above average intellectual ability, task commitment and /or motivation, and creative ability” (Simon, Penix, & Biggers, 1999, p. 5).
2. Enrichment is defined by the researcher as adding to the student knowledge base through interest-based learning.
3. Enrichment cluster is defined as “allow[ing] groups of students who share a common interest to come together each week during specially designated time

blocks to produce a product, performance, or target service based on that common interest” (Renzulli, Gentry, & Reis, 2014, p. 17).

4. Microaggressions are defined as “any comment, attitude, action, or gesture individuals experience as inappropriate or hurtful based on their personal history and characteristics” (Stambaugh & Ford, 2014, p. 192).

## **Chapter II**

### **Literature Review**

There is some research that has been done regarding after-school programming. This is a rather important field of research and analysis, as reports indicate that “over eight million K-12 children participate in after-school programs,” according to researchers Grogan, Henrich, and Malikina (2014, p. 1). In order for after-school program quality to increase, thorough evaluation and research must be completed. Not only does after-school programming aid in students’ learning, but it may also influence in-class behaviors as well. One study suggests “individual student engagement in specific types of after-school activities is associated with positive student outcomes during the school day” (Grogan, et al., 2014, p. 8). The effects of quality after-school programs can make a significant impact on a student’s academic career.

### **Gifted and Talented Enrichment**

These quality after-school and out-of-school programs often offer academic enrichment for students. One particular study by Miller and Gentry (2010) created a program specifically for gifted and talented students who were primarily from low-income households. In their study, they analyzed the effectiveness of the enrichment program that they called “Super Saturday,” in which participating students were in “classes containing 18 or fewer students...offered from 9 a.m. until noon for 6 Saturdays during the fall semester and again for 6 Saturdays during the spring semester” (Miller & Gentry, 2010, p. 606). There were four themes that were noticed and studied throughout the administration and analysis of the program: students had positive learning experiences, students learned new,

above-grade-level concepts, students participated in interactive learning, and students experienced social support (Miller & Gentry, 2010). These particular study results are limited, due to the fact that they came from one out-of-school program, rather than samplings from many. However, these results are still valuable for developing other after and out-of-school programs.

A specific curriculum and plan has also been developed for gifted and talented and other student learning, called “enrichment clusters.” Psychologists and researchers Renzulli, Gentry, and Reis (2014) have developed this tactic. These “enrichment clusters” call for students to be grouped into clusters, or clubs, based on their interests. Enrichment clusters are clearly defined as: “allow[ing] groups of students who share a common interest to come together each week during specially designated time blocks to produce a product, performance, or target service based on that common interest” (Renzulli, Gentry, & Reis, 2014, p. 17). The students may also evaluate these particular enrichment clusters through a numerical system, in order to obtain feedback to enhance the program (Renzulli, Gentry, & Reis, 2014). Enrichment clusters may be made more academic in order to achieve higher thinking levels within the students.

Gifted and talented students could essentially receive more and better services through after-school enrichment programming. Among these services include creativity enhancement. “Creativity training programs are effective in influencing a variety of creativity-related outcomes,” essentially meaning that when implementing creativity enhancement, the measurable outcome is creativity-related (Beghetto, 2008, p. 150). Not only is creativity a key factor, but other subjects, such as math and sciences can be pursued for enrichment as well.

### **Mentoring and Relationships**

Through after-school programs, children have the opportunity to interact with adults who are not their immediate caregivers. There are prospective mentoring relationships that could potentially come from these programs. Research has been done demonstrating the difference, positive or negative, that labeling a student has on the quality of the learning help they receive. According to one particular study, the “disability label affected the type of instruction [student] received in this tutoring space” (McCloskey & Cann, 2013, p. 353). The same concept may also be broadened to the labeling of gifted and talented students, as well as low-income students. Students must not be branded with a label that hinders the quality of academic instruction received. Relationships with the staff members of the school and after-school programs are vital to the child’s academic success. These relationships can make a difference in a student’s life. As “gifted individuals may also struggle with identity and social acceptance,” the relationships formed with staff members are crucial to social development (Stambaugh & Ford, 2014, p. 194). It is vital that staff members are sensitive to the emotional and social needs of students, and when necessary, possessing the capability to contact the school’s counselor.

### **Ethnic Diversity**

Research suggests the underrepresentation of gifted individuals who are ethnically diverse or low-income is common in many programs. According to researchers Gentry, Hu, and Thomas, “As of 1993, the U.S. Department of Education reported that Black, Latino/a, and Native American students were underrepresented by 50-70% in gifted education programs” (2008, p. 197). Identifications and achievements of ethnically diverse students

may look differently than those of traditional students. It is also evident that gifted and talented students and ethnically diverse students are more likely to be subject to microaggressions, which are “any comment, attitude, action, or gesture individuals experience as inappropriate or hurtful based on their personal history and characteristics” (Stambaugh & Ford, 2014, p. 192). Staff members and other people in the child’s life must closely examine these microaggressions. An example of a microaggression would be, perhaps, a reaction to a gifted characteristic, for example, advanced moral and intellectual development. A microaggression in reaction to this trait might be something along the lines of, “You don’t have to go into that much detail,” or “Stay out of adult conversations and try to relate to kids your own age” (Stambaugh & Ford, 2014, p. 194). These microaggressions send a message that “No one cares about those issues; relax, drop the subject, and move on” (Stambaugh & Ford, 2014, p. 194). These microaggressions could also be racially charged; for example, a microaggression in reaction to a theme that a “culturally different student is presumed to be dangerous, criminal, or deviant on the basis of his or her race/ethnicity” (Stambaugh & Ford, 2014, p. 196). A microaggression in reaction to this theme might be, “A White teacher feels safe working with only gifted white students,” and this sends a message that “Gifted Black and Hispanic students will use their talents to commit crimes” (Stambaugh & Ford, 2014, p. 196). These microaggressions are detrimental to the goals of school and after-school programs.

### **Summary**

This chapter reviewed relevant literature and research related to after school enrichment programs for advanced students and their impact on students’ attitudes



toward school. This next chapter will highlight the setting, participants, data collection methods and analysis used in the study.

### **Chapter III**

#### **Methodology**

This chapter will discuss the methodology behind the study, including participants, data collection, and intervention strategies. A researcher developed an enrichment club for a specific northwest Arkansas after-school program, which has majority low-income students, was created. This program was implemented for one day a week for ten weeks. Children were chosen for the program, based on if they already receive gifted and talented services from a large public school system in northwest Arkansas. Children were able to, however, also choose to be a part of the enrichment program even if they are not a part of the public schools' gifted and talented program. Consent forms were distributed to the parents of the children participating in the study before the program began.

#### **Participants**

The participants who participated in this study were from an after-school program affiliated with a specific elementary school in a large school system in northwest Arkansas. Students identified as "gifted and talented" were included in this study, however students and/or their parents could also choose to be placed in the enrichment program. Students who participated in this particular after-school program come from majority Hispanic and Marshallese backgrounds. The students from this elementary school are also 99% free and reduced lunch students, generally coming from low-income families. There are 10 students who participated in this study, 9 females and one male. Students' grades ranged from 2<sup>nd</sup> to 5<sup>th</sup>, with the most students (4 of them) were in 2<sup>nd</sup> grade. Three (Students F, I, and J) of those 10 students were identified by the elementary school as "gifted and talented." These

three students were the only students in the after-school program formally identified as “gifted and talented.”

### **Confidentiality**

Permission to conduct this study was sought from the University of Arkansas Institutional Review Board (see Appendices A and B), as well as the administration of the after-school program where the study was conducted (see Appendix C). Permission to participate in this study was obtained prior to the commencement of the project. A letter (see Appendix D) and an informed consent (see Appendix E) were given to the parents of the students participating in the study. This informed consent form was required before the data for that child was reported. The informed consent described the study as well as the risks and benefits involved. It explained that the child could withdraw from the study at any time without penalty. Confidentiality was maintained and assured by the researcher. Students were assigned letters at random, and data were categorized using those letters.

### **Data Collection**

The purpose of this study was to discover if, through after-school enrichment and intervention, students’ attitudes toward school change, specifically gifted and talented students. Data were collected several times throughout the process of the enrichment program’s duration: once at the beginning, once in the middle, and once at the end. I obtained parental consent before publishing any statistics, work, or evaluations of students. Confidentiality was upheld to the utmost extent as allowed by the law.

**Evaluation instruments.** Surveys were used that utilize a mathematical rating scale, in order to rate the quality of the program. The survey used for the student participants was adapted from the *Enrichment Clusters* study (Gentry et al, 2008) (see Appendix F). The student survey had eight questions, asking students to rate their answers on a 1-3 scale. A “1” means the student agreed with the statement, whereas a “3” means a student disagreed with the statement. During the initial survey period, students were also asked to outline what they desired to do during the club time as well as their interests. This was used to determine curricular needs.

Personal interviews were also used as a data collection method for this particular study. The specific questions asked in the personal interview may be found in Appendix G. The interviews served as a way to check survey accuracy. Five random students who participated in the study were interviewed at the conclusion of the 10-week enrichment cluster.

A survey for parents from the *Enrichment Clusters* study, which may be found in Appendix H, was also used as another source of data for this study. From the initial student survey, interests were determined from which to base curriculum and enrichment needs.

**Baseline data.** The baseline data was established on November 11, 2015, or the first week in attendance of the program, whichever came first for that particular student. The student survey (found in Appendix F) was administered during the first week of attendance. The scores from this survey served to establish a level of understanding of students’ attitudes toward school and the learning process as well as the after-school program in general.

**Other data collection methods.** Other data collection methods include anecdotal notes and attendance logs. Notes were taken during after every club session regarding student behavior and functionality of the lesson itself. Attendance was taken weekly, at the beginning of each club session. If a student was absent for more than half of a club session, their attendance was marked as an absence. Students' parents were also given a survey discussing their own personal opinions on their child's school and after-school experiences.

**Post data analysis.** In order to get a full picture of students' attitudes toward school, the student survey was administered at the close of the study. Students were given this survey on the last day of the club, or the next date of attendance at the after-school program, whichever came first. These results were compared with the baseline data to determine changes and trends in data. Random students in the study were also interviewed after the completion of the ten weeks, in order to further understanding. Following this analysis, conclusions were drawn concerning data.

### **Intervention Strategies**

After the initial student survey, a curriculum was created, using the *Understanding By Design* model, in order to serve student interests. Each week's activity featured one concept or idea pulled from a student's initial interest survey. Table 1 provides a brief snapshot of each week's lesson topic.

*Table 1.* Timeline of Lesson Dates and Lesson Topics.

<b>Date of Lesson</b>	<b>Lesson Description</b>
November 11, 2015: Week 1	<b>Introductions</b> <ul style="list-style-type: none"> <li>• Students were introduced to the club.</li> </ul>
November 18, 2015: Week 2	<b>Ice Cream</b> <ul style="list-style-type: none"> <li>• Students made ice cream.</li> </ul>
December 2, 2015: Week 3	<b>Slime Time</b> <ul style="list-style-type: none"> <li>• Students made variations of a “slime” mixture.</li> </ul>
December 9, 2015: Week 4	<b>Gingerbread Structure Part I</b> <ul style="list-style-type: none"> <li>• Students began work on a gingerbread structure.</li> </ul>
December 16, 2015: Week 5	<b>Gingerbread Structure Part II</b> <ul style="list-style-type: none"> <li>• Students finished work on a gingerbread structure.</li> </ul>
January 27, 2016: Week 6	<b>Making Pizza</b> <ul style="list-style-type: none"> <li>• Students made pizza.</li> </ul>
February 3, 2016: Week 7	<b>Volcano Research</b> <ul style="list-style-type: none"> <li>• Students utilized technology to research volcanoes.</li> </ul>
February 10, 2016: Week 8	<b>Volcano Model Building Part I</b> <ul style="list-style-type: none"> <li>• Students began work on building a</li> </ul>

	working volcano model.
February 18, 2016: Week 9	<b>Volcano Model Building Part II</b> <ul style="list-style-type: none"> <li>• Students continued work on building a working volcano model.</li> </ul>
February 24, 2016: Week 10	<b>Volcano Eruption</b> <ul style="list-style-type: none"> <li>• Students erupted volcano model.</li> </ul>

**Week 1: Introductions.** In the first week of the club, students began by completing a survey regarding their attitudes toward school. They also completed a survey regarding what activities they would like to accomplish in the club. Students had the opportunity to spend much time on this survey in particular, so they could really think about what they wanted to do. It was an open-ended question, allowing for a variety of responses. After some time to think about what they wanted to accomplish, the club played with a “Toss-n-Talk” ball (a ball with get to know you type questions written on it). Whichever question your right thumb landed on was the question you had to answer. The students and researcher spent much time playing with this ball in order to get to know one another. Finally, the students in the club were given a science, technology, engineering, and math (STEM) challenge to build a tower out of dried spaghetti pasta that would support the weight of a golf ball. Students were to work in pairs to complete the challenge. Each group was given a set amount of supplies to complete the challenge. The objective of this challenge was to teach creative thinking, problem solving skills, and teamwork. Each lesson hereafter was developed after reviewing their interest surveys. See Appendix I for this week’s lesson plan.

**Week two: Ice cream.** After reviewing the student survey answers regarding what they would like to accomplish in this club/what they were interested in, “making ice cream,” for this week was chosen, as several students wrote that on their survey as something they would like to do. The students and the researcher began the club by completing a “human scavenger hunt” game, where students had to identify other students that fit the description on their paper. Examples of descriptions were: “Find a student who loves science,” or “Find a student who has been out of the country.” The group then moved into the activity portion of the club. The students and researcher discussed as a group what flavors of ice cream the students desired to make. The researcher gave them the flavor options, allowing for combinations of any of the flavors available. Students then brainstormed what combinations might sound good, and then voted on the top three choices. The students then split into three groups and the researcher assigned each group one of the three voted-on flavors to make. Students made the ice cream in groups, following a recipe. At the end of the club, when the ice cream was ready, each student was able to sample the three flavors. The students and researcher discussed what worked and what did not work in the ice cream making process. See Appendix J for this week’s lesson plan.

**Week three: Slime time.** This week, the group made slime. The club began by playing a “Clue” game, where students had to write their answers to some get to know you questions on an index card, and when read aloud, students had to guess whose answers they were. After playing the game, the students then moved into the activity portion of the club. Students were split up into three teams, and each team was given a different recipe to make slime. Students in their teams had to follow the slime recipe to get a final product of slime. At the end of the club, the students and researcher discussed which recipe was



deemed to be the best after reviewing each group's final product. Each student got to take home a bit of the slime his or her team made. See Appendix K for this week's lesson plan.

**Week four: Gingerbread structure part I.** At the beginning of the club, the students and the researcher played with the "Toss-n-Talk" ball to continue to get to know one another. Then after some time, the group moved into the day's activity. Students were spending this week's club meeting and the next week's club meeting constructing a gingerbread structure, appropriate as it was nearing the winter holidays at this time. The first half of this was devoted to deciding what gingerbread structure to make. The researcher showed the students pictures of several gingerbread structures that were not necessarily traditional, such as gingerbread Presidential White House, and a gingerbread hospital. Students suggested ideas, and those ideas were then written on a large white board. After discussing ideas for a while, students narrowed their ideas down, and finally landed on deciding to build a replica of the center in which the after school program takes place. Students then set to work on building the bones of the structure using graham crackers, cardboard, and icing. Students did not decorate the structure this day, but just built the walls, roof, etc. The students and researcher critiqued the structure at the end to decide what needed to be worked on the next week. See Appendix L for this week's lesson plan.

**Week five: Gingerbread structure part II.** At the beginning of this club, the group discussed how they were going to decorate the gingerbread structure built the previous week. The students and researcher reviewed expectations and procedures for decorating as well as self-control. The group then spent the majority of the allotted time together decorating the gingerbread structure to make the replica look more like the center. They

were able to use a variety of candies, as well as icing, and more graham crackers. The final product was placed on display at the community Christmas dinner, put on by the after school program. Parents and family members were able to view the final product. See Appendix L for this week's lesson plan.

**Week six: Making pizza.** This week, the students and researcher began the club by sitting and spending time talking to one another in order to further relationships. The group then moved forward with the activity for the day: making personal pan pizzas. Each student was allowed to assemble his/her own personal pan pizza, using dough, sauce, cheese, and pepperonis. The group discussed how they might divide the dough for the amount of people we had making pizza. This led into a group discussion regarding fractions. After the pizzas were done baking, students were allowed to eat them, as they discussed fractions and real-life applications from this activity. Students discussed how they might be able to duplicate this recipe at home. See Appendix M for this week's lesson plan.

**Week seven: volcano research.** This week began a four-week project with the club. To begin the club, students played a game called "Maitre'd." Students were to get into groups based on the "party" number called aloud, and answer the question to be discussed. An example of this would be, "get into a party of three, and discuss what your favorite childhood memory is and why." After playing this game, students were to get into partnerships and share an iPad to research volcanoes. They could write down any facts they learned, draw diagrams, etc. on a blank sheet of white paper. The researcher gave each partnership a particular topic to research on their iPads. Students were also to devise a

way they might make a model volcano. As the students worked, the students and researcher discussed the findings on volcanoes. See Appendix N for this week's lesson plan.

**Week eight: Volcano model building part I.** This week, the group constructed a volcano model, using paper mâché. At the beginning of the club, students reviewed expectations and discussed the day's happenings. Then, the students and researcher discussed procedures related to the volcano model building. Students were given a large plastic jug, cardboard, newspaper, and a glue solution made of water and flour to complete the paper mâché model. The researcher demonstrated how to dip the newspaper strips into the glue solution and place them on the jug and cardboard base. Students were placed in charge of making sure supplies did not run low. As the students worked, the group discussed how this model might resemble a real volcano, based on what they learned in their research the previous week. See Appendix O for this week's lesson plan.

**Week nine: Volcano model building part II.** This week, the students painted the now-dry paper mâché volcano model constructed the previous week. At the beginning of the club, the students and researcher discussed expectations and the day's happenings. The group discussed what colors a volcano might be, and searched images of volcanoes using an iPad. Students then decided to paint the model grey, black, green, and brown; based on the images they viewed. The students got to work painting the entire model of the volcano. The painting took the entire club time from start to finish. See Appendix O for this week's lesson plan.

**Week ten: Volcano eruption.** The final week of the club, students were allowed to conduct an experiment to erupt the volcano using various ingredients such as vinegar, baking soda, and dishwashing liquid. The students began the club by taking a post survey,

and discussing what their thoughts were on the club. The students and researcher also discussed if models helped them to learn concepts better. Then, the group went outside to erupt the volcano model with simulation lava made out of the household ingredients. Students were in charge of certain ingredients being added to the volcano's vent. After erupting the volcano several times, the group discussed how it might be similar to a real volcano and how it might differ. This was the tenth and final club. See Appendix O for this week's lesson plan.

### **Summary**

This chapter detailed methodology, including intervention strategies and a week-by-week break down of intervention methods. The next chapter will reveal the study's findings and data.

## Chapter IV

### Results

This chapter will report findings from the research. Pre and post assessments were administered to the participants. A survey for participants' parents was also administered. Student interviews were conducted after the conclusion of the ten-week intervention.

#### Baseline Data

Students took a pre-intervention survey regarding their attitudes toward school and the after-school program. This survey can be found in Appendix F. The maximum score possible on that survey was a 24. The minimum score possible was an 8. The student mean for the pre-intervention survey was 22.7 (see Appendix P).

#### Other Types of Data

**Parent surveys.** Surveys were administered to the parents of the students participating in the study. The parent survey is featured in Appendix H. Parent surveys were used to further understanding regarding students and their attitudes toward school. Side by side data with parent survey scores and student pre and post survey scores is displayed in Table 1 and Figure 2.

*Table 2. Student and Parent Data.*

Student	Student Pre Survey Score	Student Post Survey Score	Parent Survey Score
Student A	22	21	37
Student B	22	22	38
Student C	23	Survey Incomplete	Survey Incomplete
Student D	24	21	50
Student E	24	22	50
Student F	21	22	50
Student G	20	22	47
Student H	24	Survey Incomplete	46
Student I	24	Survey Incomplete	Survey Incomplete
Student J	23	19	49

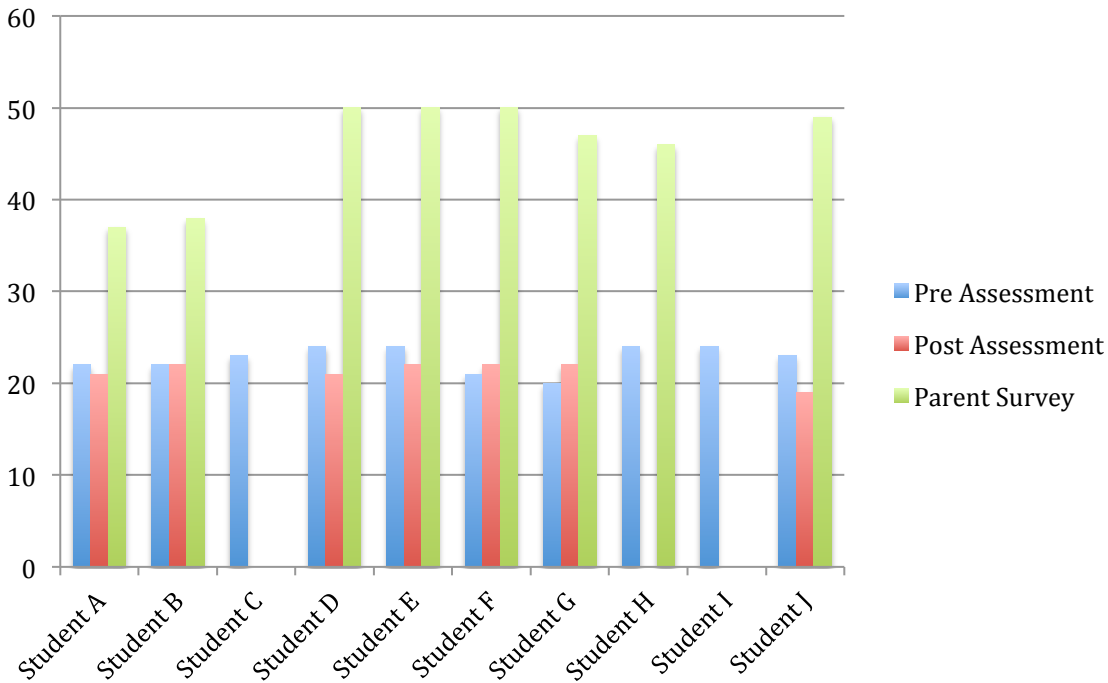


Figure 1. Bar graph with student and parent data.

The highest score possible on the student survey was a 24. The highest score available on the parent survey was a 50. Parents also had the opportunity to comment on three questions regarding their students' school experience. The parent comments are featured in Table 3. The parents' comments were mostly in Spanish, so many of the comments were translated from Spanish to English. The comments that were translated are denoted in Table 3 with an asterisk.

*Table 3. Parent Survey Comments.*

Parent of:	Question 1: What do you like most about your child's school experience?	Question 2: What changes would you like to see regarding your child's school or classroom experience?	Question 3: Please provide other comments that will help us understand your attitude toward school and satisfaction with your child's experience in his or her classroom or school.
Student A*	That I learned to write on computers and reading.	To motivate them a little more to learn every day much better.	Her experience is good because she is a girl who participates in class.
Student B	No comment	No comment	No comment
Student C	No survey data	No survey data	No survey data
Student D*	That I learn and participate in different activities.	I think no.	No comment
Student E*	That I learn and	I think no.	No comment



	participate in different activities.		
Student F*	Ask for feedback for all.	None.	No comment
Student G	Reading.	Teach more math.	No comment
Student H*	His teacher's support and if you need some help.	All is well for me. Maybe go once a month to go to the room with the children and teachers.	It seems to me perfectly help.
Student I	No survey data	No survey data	No survey data
Student J*	They have all the experience to teach them what they need.	Nothing changes. They take very good communication.	No comment

### During Intervention

**Anecdotal records.** Notes were taken during each club session on various aspects of the club and the students. Student behaviors and changes were noted. In addition to notes regarding students, aspects of the lesson that went well and did not go well were noted. Through anecdotal records, it is duly noted that the students learned through this process. See Table 3 for a complete record of anecdotal notes.

*Table 3. Anecdotal Records Taken During the Intervention Period.*

<b>Date of Lesson</b>	<b>Anecdotal Notes</b>
November 11, 2015:  Week 1	<ul style="list-style-type: none"> <li>• One student (Student C) did not seem to want to work with a partner. It took a lot of coaxing to get him/her to work at the beginning.</li> <li>• This same student (Student C) likes cars and playing with cars.</li> <li>• Students F and G won the spaghetti tower challenge.</li> </ul>
November 18, 2015:  Week 2	<ul style="list-style-type: none"> <li>• The students loved making ice cream.</li> <li>• The final product turned out great.</li> <li>• There potentially could have been more chemistry included in the lesson (freezing points, etc.).</li> <li>• Student C was more engaged this time.</li> <li>• The students got restless when shaking the ice cream bag (because only one person could shake it at a time).</li> <li>• The students loved brainstorming their own flavors and flavor combinations.</li> <li>• Pushing the tables together into one big table where everyone sits together worked well for this group.</li> <li>• The team building activities at the beginning of the club worked well. The human scavenger hunt was engaging.</li> </ul>
December 2, 2015:	<ul style="list-style-type: none"> <li>• Slime making was good.</li> </ul>

Week 3	<ul style="list-style-type: none"> <li>• For the get to know you activity, next time maybe do three interesting facts about yourself, rather than having the students give their answers to particular questions.</li> <li>• For the “snowball fight” part of the team building activity, bigger pieces of paper are needed. The little paper was difficult to see.</li> <li>• Some slime recipes worked well, and others did not.</li> <li>• Next time, include pictures with all sets of slime directions, with simplified instructions.</li> <li>• The concept of measurement seemed difficult for the students when not explicitly explained.</li> <li>• Students D, E, and J were very easy to keep on task.</li> </ul>
December 9, 2015: Week 4	<ul style="list-style-type: none"> <li>• This was the first day of making the gingerbread structure.</li> <li>• The structure fell apart at first.</li> <li>• The students thought of several design ideas, but landed on building a community center replica.</li> <li>• It took some trial and error to get started.</li> <li>• The discussion of design ideas at the beginning of the club was good and fluid.</li> </ul>
December 16, 2015: Week 5	<ul style="list-style-type: none"> <li>• The students built most of the gingerbread structure today.</li> <li>• The students were all engaged. It was not difficult at all to get them involved.</li> </ul>

	<ul style="list-style-type: none"> <li>• The students were so proud of their miniature community center.</li> </ul>
<p>January 27, 2016: Week 6</p>	<ul style="list-style-type: none"> <li>• The club made pizza today.</li> <li>• There were only five students present today.</li> <li>• The students enjoyed making pizzas.</li> <li>• The students understood fractions better after discussing the splitting up of the pizza into sixths.</li> <li>• It was also good real-world cooking experience. (They could make pizza at home for minimal cost.)</li> <li>• Student G stated that fractions are difficult for him/her in school, but talking about fractions in the sense of food and pizza helped him/her understand fractions better.</li> <li>• There was a modification to the lesson: the group did not play the opening activity “Maitre’d” today. The group just sat and talked before getting started.</li> </ul>
<p>February 3, 2016: Week 7</p>	<ul style="list-style-type: none"> <li>• There were six students present.</li> <li>• Student F left early.</li> <li>• The students broke into pairs and each pair had an iPad to use.</li> <li>• The researcher gave each pair a topic to research: (1) What is lava, (2) How volcanoes form, and (3) what a volcano does.</li> <li>• The students played the “Maitre’d” game this time and it</li> </ul>

	<p>somewhat worked.</p> <ul style="list-style-type: none"> <li>• The students researched ways to make model volcanoes.</li> </ul> <p>There are many ways to go about it.</p> <ul style="list-style-type: none"> <li>• The students used YouTube.</li> </ul>
February 10, 2016: Week 8	<ul style="list-style-type: none"> <li>• Making the model volcano out of paper mâché was a huge hit.</li> <li>• The students and researcher did not play a team building game this time. The group just got straight to work.</li> <li>• The students thoroughly enjoyed making this model.</li> </ul>
February 18, 2016: Week 9	<ul style="list-style-type: none"> <li>• The students painted the volcano today.</li> <li>• The students used lifelike colors (green, brown, black, grey, and white).</li> <li>• The paint was rather messy.</li> <li>• Students D and E are still pretty quiet.</li> </ul>
February 24, 2016: Week 10	<ul style="list-style-type: none"> <li>• The students seem to agree that making models helped them learn better.</li> <li>• They were able to investigate volcanoes.</li> <li>• The students really loved making ice cream, slime, pizza, and the volcano out of all the activities completed in the club.</li> </ul>

### Post Intervention

Students were given the student attitudes survey both before and after intervention to measure growth. The mean scores from the pre-intervention survey and post-intervention survey were compared using a paired-sample *t-test* and the results found a

statistical difference. The *t-test* results are featured in Table 5. The scores declined between the pre and post survey. It was a significant decrease. The results are presented in Figure 2. Students F, I, and J were formally identified as gifted and talented, while the other students were not formally identified. For complete *t-test* results, see Appendix P.

Table 5. Results Obtained from *t-test* for Pre and Post Surveys.

Pre Survey		Post Survey				
N	Mean	N	Mean	<i>t</i>	<i>t Stat</i>	<i>p</i>
10	22.7	7	21.285714 3	2.1314495 5	2.3003910 9	0.0180984 6

The students in the club already had quite high scores on the pre-intervention survey, so there was not much room for difference on the post-intervention survey. There was some variation between scores on individual students, as seen in Figure 2. In Figure 2, the students who were formally identified as gifted and talented (Students F, I, and J) are denoted with an asterisk beside their names. Analysis of the data revealed that four students decreased their scores from the pre to the post assessment, three students increased their scores, and three students did not take the post assessment.

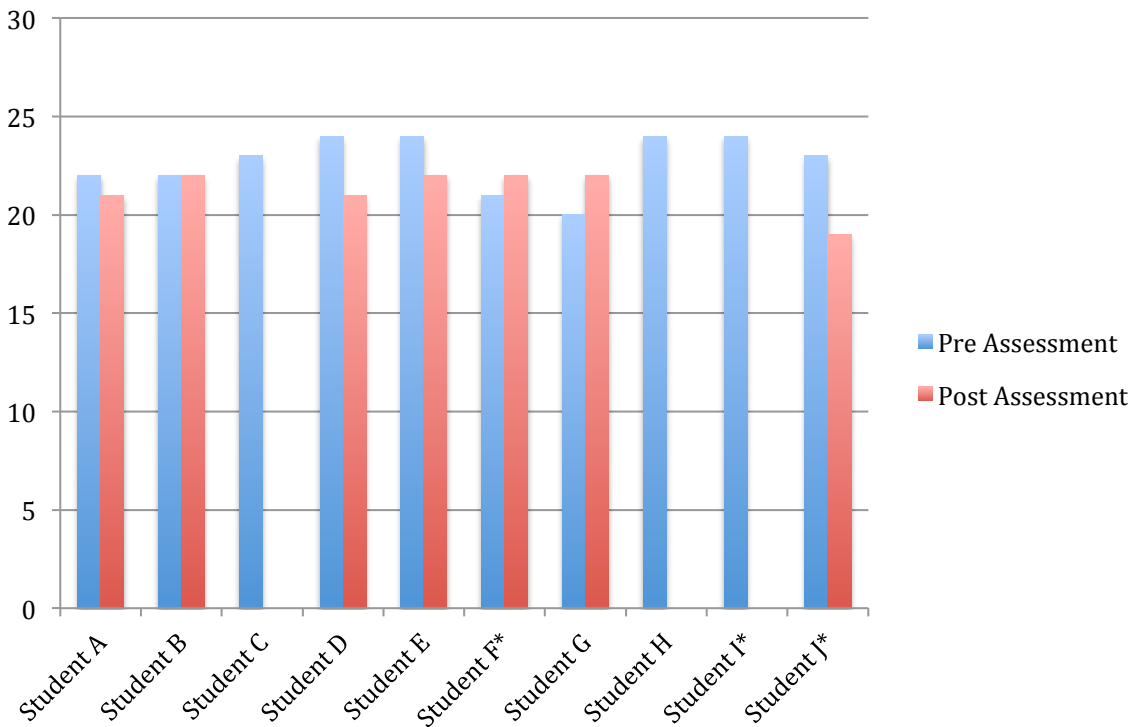


Figure 2. Bar graph featuring individual student scores for pre and post assessments.

**Interviews.** Five students were randomly selected for interviewing using the questions featured in Appendix G. The findings of this qualitative data were thematically incongruent with the student pre and post survey results. The qualitative data conflicted with the quantitative data. The randomly selected students all stated that they both enjoyed elementary school and the after-school program. One of the students interviewed was formally identified as gifted and talented, while the other four students interviewed were not formally identified. All loved the enrichment cluster “club,” and almost all believed the cluster to be helpful in improving attitudes toward school. Students interviewed stated that their attitudes toward school had either improved or stayed the same since attendance in the enrichment club and the after-school program as a whole. One

student, Student B, stated that at the after-school program, learning happens concurrently with fun activities, whereas at school, this is not always the case. The interviews aided in data interpretation.

### **Summary**

This study of an after-school enrichment program on students' attitudes toward school was a ten-week program for a group of ten students, three of them being formally identified as gifted and talented. The quantitative data showed statistically significant. The survey results showed decline in student scores from pre survey to post survey. However, through the anecdotal notes and individual student interviews (qualitative data), students seemed to have positive attitudes toward school and the after-school program. Post-study, students who were a part of the club would approach me to ask if we would be having it again. They genuinely looked forward to the work we did together as a small group. Though the quantitative results showed decline, this does not mean they may not have implications on further teaching and programming.



## Chapter V

### Discussion

The purpose of this study was to answer the research question: “Does an after-school program designed to cater to student needs affect student attitudes toward school?” The study was found to be statistically significant through quantitative data analysis. The quantitative data revealed that students’ attitudes actually declined between the pre and post survey periods. However through qualitative data analysis, it suggests that students did hold a positive attitude toward school and found the enrichment experiences enjoyable. It is concluded that generally, students enjoyed interest-based learning in the small group club-type format. Each of the activities the students completed were planned based on interests they stated in their pre-survey. The interviews conducted with the students, however, revealed that their attitudes had improved since attending the after-school program on the whole. The interviews also revealed that students enjoyed the interest-based club (enrichment cluster).

### Conclusions

The results of this study are similar to those of others (Stambaugh & Ford, 2014). With students in the study being of minority, it promotes an attitude of tolerance, potentially rejecting microaggressions as discussed in the research of Stambaugh and Ford (2014, p. 196). The study supports findings from the *Enrichment Clusters* model, developed by psychologists and researchers Renzulli, Gentry, and Reis. Much of the program was based on the enrichment cluster model. It is apparent that students enjoyed the interest-based piece of the club program. This is supported through interview data and anecdotal

records. The study examined the effectiveness of interest-based programming, using student attitudes as a measurement tool.

The study was conducted to answer the research question, “Does an after-school program designed to cater to student needs affect student attitudes toward school?” The data collected through surveys was statistically significant. On the whole, the data collected through this study aligns with other studies conducted previously.

### **Limitations**

In this study, there were multiple limitations over which the researcher had no control, which may have affected the outcomes of the study. One limitation was the fact that there was missing data, and imperfect attendance among students. Because students attended a pre-established after-school program, there was always the opportunity to withdraw from the program at large. At the close of the fall semester, three students did withdraw from the after-school program, resulting in incompleteness of the study. This also resulted in missing data for students C, H, and I. These students are missing post survey data due to this withdrawal. Student I was formally identified as gifted and talented. There is also some data missing for the parent surveys, as students C and I never returned theirs, due to circumstances over which the researcher had no control.

Another limitation was the design of the student pre/post survey. Because the survey required students to put a “1” when they agreed with a statement, rather than a “3”, the survey had to be reverse scored. Also because of this, students were easily confused by what the survey was requiring them to do. The survey may not have been a completely accurate picture of student beliefs and ideas.

Another limitation of the study was the time available for student participation. Had the students been studied over a longer period of time, results may have been more conclusive. This is uncertain. Time was definitely a factor in the limitations of the study. Students who were absent from the program for any period of time did not receive the same amount of services as those who were present each session. The limitations are quite specific to this study. However, wider limitations, such as time, could impact future studies as well.

What was found through the pre and post assessments is that the students who participated in the study generally already liked school. While the students enjoyed the enrichment cluster (as demonstrated through interview data), perhaps these students are not a representative sample. This is another limitation of the study: the student sample. If this study were to be replicated, perhaps it might include students who already have negative attitudes toward school, thus allowing room for growth.

### **Implications**

The study has implications on future programs and learning. Because there was not much of a difference between pre and post survey scores, the study could not necessarily be properly conclusive. The students already had high achieving scores on the pre survey; so essentially, their post survey scores had no room for growth. Implications for future study are that the program could be implemented in the future, with options for higher numbers (possibly a 1-5 scale), rather than a 1-3 scale for answering.

Through the data collected through anecdotal notes and interviews, it is evident that the students quite enjoyed the project-based club. They enjoyed learning about concepts,

topics, and ideas in which they were interested. Because students enjoyed learning about the concepts that interested them, their retention for the content might have been higher. That is another aspect of the study that could be measured for another time this study might be completed: retention rates for interest-based learning. The study implies that basing curriculum on student interest results in students enjoying the learning experience.

Another implication of this study was the aspect of the formal identification of gifted and talented students. Only three of the students in the study were formally identified as gifted and talented. However, during the intervention period, it was difficult to differentiate between formally identified gifted and talented students and students who were not formally identified. There were not distinct differences. Each student (not solely gifted and talented students) in the enrichment cluster generally enjoyed the learning tasks. This is evident through anecdotal records and interview data.

### **Recommendations**

Further research on the subject of effective after-school programming would be beneficial in understanding how students learn best and develop a positive attitude toward school. The researcher recommends that teachers or after-school programs might integrate interest-based activities into the curriculum to supplement student learning.

The researcher also recommends that in future, after-school programming might be best served in training staff to develop relationships with students and take note of their interests, in order to best serve the students. Students might also be served best if staff members of after-school programs went through professional development courses in how to best serve students based on development stage. After-school programs might be able to

develop programming that was interesting to the students, thus engaging them further in the learning process.

### **Summary**

This chapter has reviewed the research, in relation to previous research and studies. In conclusion, the research was statistically significant, but inconclusive. However, this does not mean that there are not implications for the study or that the study was not impactful on the students. A more interesting aspect of this particular study might be to research students specifically with negative attitudes toward school, and replicate the study targeted toward those students. Another interesting piece that could be studied would be the reasoning behind student attitudes toward school. Are students who are already successful in school more apt to have positive attitudes? Are students with negative attitudes toward school less likely to succeed in school? These are some questions drawn from the study that would be worth investigating. The study holds promise for students and educators alike, and is still worth investigating further.

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## Appendix A

### UNIVERSITY OF ARKANSAS INSTITUTIONAL REVIEW BOARD PROTOCOL FORM

The University Institutional Review Board recommends policies and monitors their implementation, on the use of human beings as subjects for physical, mental, and social experimentation, in and out of class. . . . Protocols for the use of human subjects in research and in class experiments, whether funded internally or externally, must be approved by the (IRB) or in accordance with IRB policies and procedures prior to the implementation of the human subject protocol. . . . Violation of procedures and approved protocols can result in the loss of funding from the sponsoring agency or the University of Arkansas and may be interpreted as scientific misconduct. (*see Faculty Handbook*)

Supply the information requested in items 1-14 as appropriate. **Type** entries in the spaces provided using additional pages as needed. In accordance with college/departamental policy, submit the original **and** one copy of this completed protocol form and all attached materials to the appropriate Human Subjects Committee. In the absence of an IRB-authorized Human Subjects Committee, submit the original of this completed protocol form and all attached materials to the IRB, Attn: Compliance Officer, ADMN 210, 575-2208. Completed form and additional materials may be emailed to [irb@uark.edu](mailto:irb@uark.edu). The fully signed signature page may be scanned and submitted with the protocol, by FAX (575-3846) or via campus mail.

#### 1. Title of Project

The Effects of an Elementary After-School Enrichment Program on Gifted and Talented Students' Attitudes Toward School

2. (Students **must** have a faculty member supervise the research. The faculty member must sign this form and all researchers and the faculty advisor should provide a campus phone number.)

Name	Department	Email Address	Campus Phone
Principal Researcher Madison Cunningham		mncunnin@uark.edu	
Faculty Advisor Marcia Imbeau	Curriculum and Instruction	mimbeau@uark.edu	479-575-3570

3. Researcher(s) status. Check all that apply.



Faculty    Staff    Graduate Student(s)    Undergraduate Student(s)

4. Project type

Faculty Research    Thesis / Dissertation    Class Project    Independent Study /  
 Staff Research    M.A.T. Research    Honors Project   Educ. Spec. Project

5. Is the project receiving extramural funding? (Extramural funding is funding from an external research sponsor.)

No    Yes. Specify the source of funds

6. Brief description of the purpose of proposed research and all procedures involving people. Be specific. Use additional pages if needed. (**Do not** send thesis or dissertation proposals. Proposals for extramural funding must be submitted in full.)

Purpose of research:

The purpose of this research study is to provide consistent academic enrichment specifically for, but not limited to, gifted and talented students who attend the SOAR after school program through Camp War Eagle for students from Jones Elementary in Springdale, Arkansas. I will be measuring students' attitudes toward school and themselves both before and after the enrichment program takes place via surveys. I will also be taking detailed notes throughout the process. I will develop extensive curriculum and lesson plans for this project.

Procedures involving people:

The 15-20 students that will be a part of this study all come from Jones Elementary in Springdale, Arkansas, and range in grades K-5. The students attend the SOAR after school program through Camp War Eagle, held at the Jones Center for Families in Springdale, Arkansas as well. My enrichment program will meet for one hour, once a week, on Wednesdays for a total of 10 weeks, both in the fall and spring semesters.

7. Estimated **number of participants** (complete all that apply)

15 Children under 14      \_\_\_\_\_ Children 14-17      \_\_\_\_\_ UA students (18yrs and older)      \_\_\_\_\_ Adult non-students

## 8. Anticipated dates for contact with participants:

First Contact November 2015    Last Contact March 2016

9. Informed Consent procedures: The following information must be included in any procedure: identification of researcher, institutional affiliation and contact information; identification of Compliance Officer and contact information; purpose of the research, expected duration of the subject's participation; description of procedures; risks and/or benefits; how confidentiality will be ensured; that participation is voluntary and that refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled. See *Policies and Procedures Governing Research with Human Subjects*, section 5.0 Requirements for Consent.

Signed informed consent will be obtained. **Attach copy of form.**

Modified informed consent will be obtained. **Attach copy of form.**

Other method (e.g., implied consent). **Please explain on attached sheet.**

Not applicable to this project. **Please explain on attached sheet.**

## 10. Confidentiality of Data: All data collected that can be associated with a subject/respondent must remain confidential. Describe the methods to be used to ensure the confidentiality of data obtained.

All data will remain confidential. The names of students will be changed to ensure that confidentiality. Their answers to surveys and other evaluations will not be shared. I, along with my honors thesis committee, will be the only one with access to this information. I will keep my files clearly marked and private so that no others may obtain access to them.

## 11. Risks and/or Benefits:

Risks: Will participants in the research be exposed to more than minimal risk?

Yes     No

Minimal risk is defined as risks of harm not greater, considering probability and magnitude, than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests. Describe any such risks or discomforts associated with the study and precautions that will be taken to minimize them.

The students will be in a contained space—the Jones Center—so minimal risks should be assumed.

Benefits: Other than the contribution of new knowledge, describe the benefits of this research.

This research is unique in that it does not just benefit the researcher, but it also benefits the subjects. Through this study, students will be gaining experience in multiple fields of study, and doing educational enrichment exercises that enhance and enable learning.

12. Check all of the following that apply to the proposed research. Supply the requested information below or on attached sheets:

- A. Deception of or withholding information from participants. Justify the use of deception or the withholding of information. Describe the debriefing procedure: how and when will the subject be informed of the deception and/or the information withheld?
- B. Medical clearance necessary prior to participation. Describe the procedures and note the safety precautions to be taken.
- C. Samples (blood, tissue, etc.) from participants. Describe the procedures and note the safety precautions to be taken.
- D. Administration of substances (foods, drugs, etc.) to participants. Describe the procedures and note the safety precautions to be taken.
- E. Physical exercise or conditioning for subjects. Describe the procedures and note the safety precautions to be taken.
- F. Research involving children. How will informed consent from parents or legally authorized representatives as well as from subjects be obtained?

I will obtain informed consent via a form that the parents and participants will sign.

- G. Research involving pregnant women or fetuses. How will informed consent be obtained from both parents of the fetus?
- H. Research involving participants in institutions (cognitive impairments, prisoners, etc.). Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.
- I. Research approved by an IRB at another institution. Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.
- J. Research that must be approved by another institution or agency. Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.

13. Checklist for Attachments

The following are attached:

- Consent form (if applicable) or
- Letter to participants, written instructions, and/or script of oral protocols indicating clearly the information in item #9.
- Letter(s) of approval from cooperating institution(s) and/or other IRB approvals (if applicable)
- Data collection instruments

#### 14. Signatures

I/we agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects/respondents are protected. I/we will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I/we agree to request renewal of approval for any project when subject/respondent contact continues more than one year.

Principal Researcher

Date

Co-Researcher

Date

Co-Researcher

Date

Co-Researcher

Date

Faculty Advisor

Date

**PROTOCOL APPROVAL FORM**

(To be returned to IRB Program Manager with copy of completed protocol form and attachments)

**Human Subjects Committee Use Only** (In absence of IRB-authorized Human Subjects Committee, send protocol to IRB.)

**Recommended Review Status**

9 Human Subjects Committee can approve as exempt because this research fits in the following category of research as described in section 9.02 of the IRB policies and procedures **(Cite reasons for exempt status.):**

Printed Name and  
Signature of the HSC Chair \_\_\_\_\_ Date

\*\*\*\*\*  
\*\*\*\*\*

9 Expedited Review by a designated member of the IRB because this research fits in the following category of research as described in section 9.03 of the IRB policies and procedures **(Cite reasons for expedited status.):**

Printed Name and  
Signature of the HSC Chair \_\_\_\_\_ Date

\*\*\*\*\*  
\*\*\*\*\*

9 Requires Full Review by the IRB because this research fits in the following category of research as described in section 9.04 of the IRB policies and procedures **(Cite reasons for full status.):**

Printed Name and  
Signature of the HSC Chair \_\_\_\_\_ Date

***IRB/RSCP Use Only***

Project Number \_\_\_\_\_ Received RSCP

Sent to: \_\_\_\_\_ Date:

**Final Status**

9 Approved as **Exempt** under section 9.02 of the IRB Policies and Procedures (**Cite reasons for exemption.**):

9 Approved as **Expedited** under Section 9.03 of the IRB Policies and Procedures because (**Cite reasons for expedited status.**)

Printed Name and  
Signature: \_\_\_\_\_ Date \_\_\_\_\_  
IRB (for the Committee)

9 Approved by **Full** review under Section 9.04 of the IRB as meeting requirements of the IRB Policies and Procedures.

Printed Name and  
Signature: \_\_\_\_\_ Date \_\_\_\_\_  
IRB Chairperson

**Appendix B****Protocol Approval Form**

October 28, 2015

## MEMORANDUM

TO: Madison Cunningham  
Marcia Imbeau

FROM: Ro Windwalker  
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 15-10-236

Protocol Title: *The Effects of an Elementary After-School Enrichment Program on Gifted and Talented Students' Attitudes toward School*

Review Type:  EXEMPT  EXPEDITED  FULL IRB

Approved Project Period: Start Date: 10/25/2015 Expiration Date:  
10/24/2016

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Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

**This protocol has been approved for 15 participants.** If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or [irb@uark.edu](mailto:irb@uark.edu).

**Appendix C**

**Letter from Organization**



Ben Rediske,

After School Program Director

[ben@campwareagle.org](mailto:ben@campwareagle.org)

October 6, 2015

To Whom It May Concern:

I am aware that Madison Cunningham is conducting an honors project titled, "The Effects of an Elementary After-School Enrichment Program on Gifted and Talented Students' Attitudes Toward School," through my program, Camp War Eagle after school program in Springdale, Arkansas at the Jones Center. This study has been approved by her thesis advisor, Dr. Marcia B. Imbeau, Professor in the Department of Curriculum and Instruction. Ms. Cunningham has my permission to conduct this study pending approval of the University of Arkansas Institutional Review Board Committee.

Sincerely,

Samantha Harp, Site Director for Jones

[sam.harp@campwareagle.org](mailto:sam.harp@campwareagle.org)

Ben Rediske, After School Program Director



## Appendix D

### Letter to Parents

#### **The Effects of and Elementary After-School Enrichment Program on Gifted and Talented Students' Attitudes Toward School**

Principal Researcher: Madison Cunningham

Hello! My name is Madison Cunningham, and I am a senior studying Childhood Education at the University of Arkansas. I hope to become an elementary schoolteacher in the very near future. For my last year of undergraduate school, I am working on an honors research project. I am seeking your permission to allow your child to be a part of my study.

My project involves an academic enrichment program for students from the Camp War Eagle after school program from Jones Elementary. The program will be for students identified as "gifted and talented" through the school and for students who volunteer to be in the program. It will meet during normal after school program time, for one hour, once a week for ten weeks total.

Previous research suggests that gifted and talented students require highly individualized educational activities. They need challenge, because without it, they can become essentially bored. There has been much success with other outside of school enrichment programs for gifted and talented individuals, and I aim for my program to allow for growth and development among the students involved.

There will be a mutual interest, as the students can sign up for the "club" well in advance, thus demonstrating interest in the enrichment club. There are no risks to your child participating in this enrichment club, but there are anticipated benefits, as they will be introduced to creative thinking, problem solving, project-based learning and research tools. The program aims to teach kids ways to use their minds creatively, and to think "outside the box." Data will be collected weekly, as well as before and after the program begins and ends. All information obtained by this study will be kept confidential to the extent allowed by the law. All data presented in this research thesis will remain anonymous.

I have been involved with Camp War Eagle for several years now, and the after school program for a little over six months. I am committed to seeing the program's success occur. I am hoping that the familiarity with the program will aid me in figuring out how your child (provided their participation) learns best. Children love to be creative and have fun with learning, and I hope to provide them with an outlet for that process to take place.

Thank you for considering your student to be a part of this program. Attached is the consent form needed to be a part of this program as well as a tentative calendar of what we will be studying. Please feel free to contact me with any questions or concerns you may have! I am excited to get started working with your child!

Madison Cunningham  
Honors Childhood Education Major  
University of Arkansas  
(479) 381-7767  
mncunnin@uark.edu

## Appendix E

### Informed Consent

#### INFORMED CONSENT

*Title:* The Effects of an Elementary After-School Enrichment Program on Gifted and Talented Students' Attitudes Toward School

*Researcher:*

Madison Cunningham, B.S.E. Student  
 Marcia Imbeau, Ph.D., Faculty Advisor  
 University of Arkansas  
 College of Education and Health Professions  
 Department of Curriculum and Instruction  
 123 PEAH  
 Fayetteville, AR 72701-1201  
 (479) 575-3570  
 mncunnin@uark.edu  
[mimbeau@uark.edu](mailto:mimbeau@uark.edu)

*Administrator:*

Ro Windwalker, Compliance Officer  
 Research and Sponsored Programs  
 Research Compliance  
 University of Arkansas  
 109 MLKG Building  
 Fayetteville, AR 72701  
 (479) 575-2208  
[irb@uark.edu](mailto:irb@uark.edu)

*Description:* This study is an honors project designed to provide enrichment for identified gifted and talented students and willing participants. This study requires that your student actively participate in activities and assessments. I will be doing a 10-week educational program for 1 hour per week. Through the program, students will be able to participate in a variety of educational activities and project-based learning. I will collect data through surveys done by the students and their guardians, as well as learning products they produce while in the program.

*Risks and Benefits:* There are no risks associated with this study since it is a volunteer after-school program. The potential benefits include improving the development of students' ability to think creatively and problem solve.

*Voluntary Participation:* Your participation in this research study is completely voluntary.

*Confidentiality:* Confidentiality will be established and maintained using pseudonyms for any names recorded during observations and interviews. All information and data collected will be kept confidential to the extent allowed by law and University policy. All data will be retained for three years after the conclusion of the study, in keeping with state and federal regulations.

*Right to Withdraw:* If you decide to participate in this program, but at any time and for any reason change your mind, you may withdraw your consent. There would be no negative consequences for this decision.

*Informed Consent:* I, \_\_\_\_\_, have read the description of this study.  
 (Please print name)

I understand the purpose of the project, the procedures to be used, the potential risks and benefits, how confidentiality will be established and maintained, and the option to withdraw.

My signature below indicates that I freely agree to participation in experimental study and that I have received a copy of this agreement from the researcher.

I am allowing my child to participate in this study, and I understand that they are expected to participate fully. I know that I can contact the researcher with any questions that I may have.

\_\_\_\_\_  
PRINTED NAME OF RESEARCH PARTICIPANT      SIGNATURE OF RESEARCH PARTICIPANT

\_\_\_\_\_  
DATE

\_\_\_\_\_  
PRINTED NAME OF PARENT/GUARDIAN      SIGNATURE OF PARENT/GUARDIAN

\_\_\_\_\_  
DATE

**Appendix F**

Handout 6A, found in *Enrichment Clusters* (2014), by Renzulli, Gentry, and Reis, p. 127. This survey was modified for use with students participating in the study.

## Student Attitudes about School and Enrichment Opportunities

Name: \_\_\_\_\_

Grade: \_\_\_\_\_

I would like to know your thoughts on school, the after school program, and clubs. Please read each statement carefully and circle the number that shows how you feel about each statement. A number 1 means that you agree with the statement. A number 2 means that you are not sure how you feel about the statement. A number 3 means that you disagree with the statement.

1. I really like school.            1        2        3
2. My schoolteacher teaches me things that interest me.            1        2        3
3. I really like the Camp War Eagle after school program.            1        2        3
4. The Camp War Eagle after school program gives me opportunities to pursue my interests.            1        2        3
5. My elementary school gives me opportunities to pursue my interests.  
1        2        3
6. I think school is important.            1        2        3
7. I think getting an education is good and important.            1        2        3

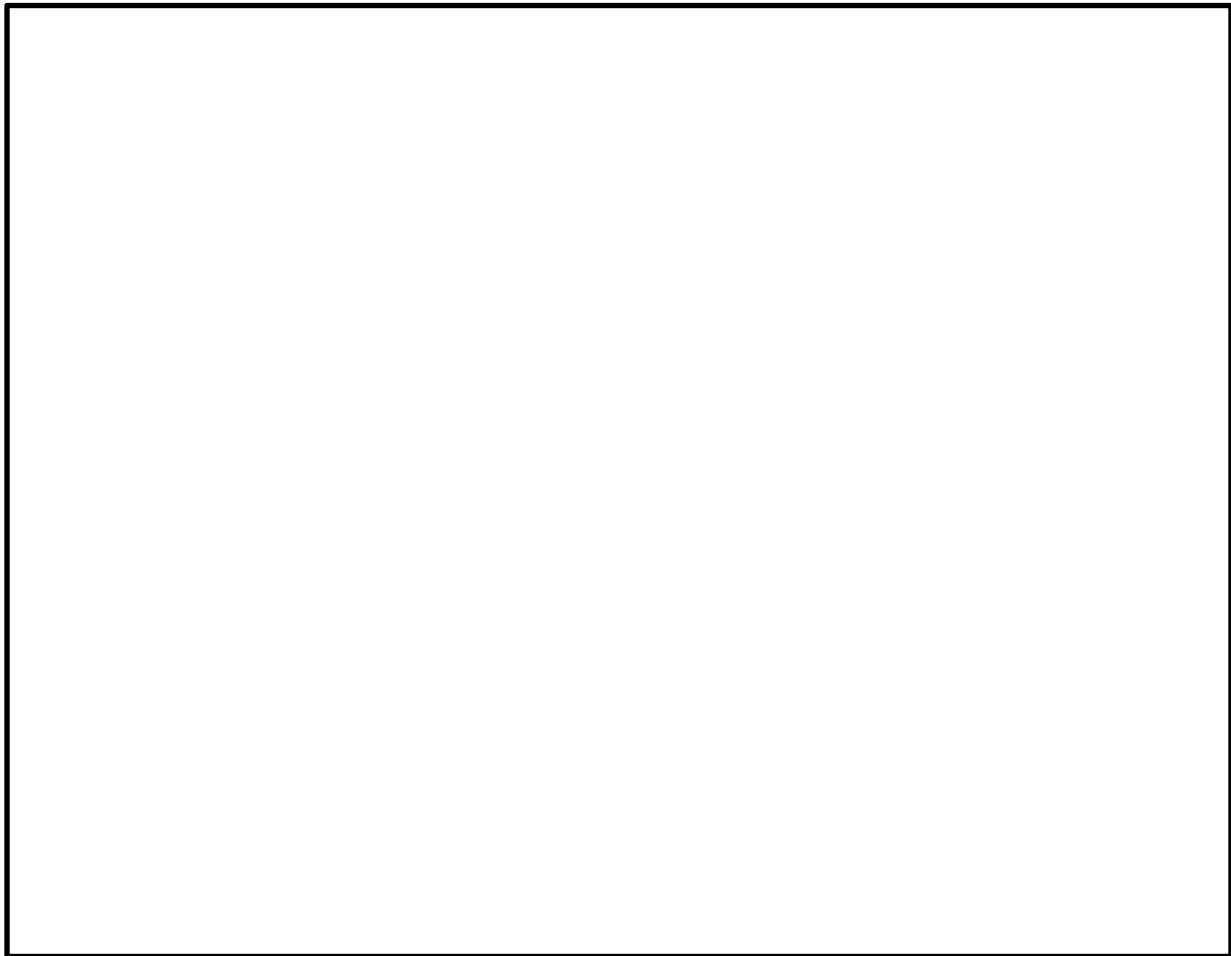
8. I enjoy club days at the Camp War Eagle after school program.

1      2      3

I would like to know what YOU want to do in this club!

Please write a few things you are interested in and things you might be interested in doing.

Some examples might be: "Sharks," or "Dinosaurs," or "Earthquakes." Some other examples might be: "I want to learn to make a tower out of Legos," or "I want to know what it takes to be a doctor." You have the space below to write or draw it out!

A large, empty rectangular box with a black border, intended for students to write or draw their responses to the questions above.

## Appendix G

### Individual Student Questions

1. Do you feel that your attitude toward school has improved since attending the after-school program?
2. Do you feel that your attitude toward school has improved since the beginning of the enrichment cluster?
3. What differences do you notice in your attitude?
4. Do you like the enrichment cluster?
5. Did you feel encouraged during enrichment cluster time?

**Appendix H**

Handout 6G, found in *Enrichment Clusters* (2014), by Renzulli, Gentry, and Reis, p. 148

## Parent Attitudes About Enrichment Opportunities

Name: \_\_\_\_\_ Child's Name: \_\_\_\_\_

Child's Grade: \_\_\_\_\_

I am the child's \_\_\_Mother \_\_\_Father \_\_\_Guardian

Following are 10 statements. Please respond to them by circling the number that best represents your answer, using the following scale:

5=always, 4=often, 3=sometimes, 2=seldom, 1=never

For the purpose of this questionnaire, enrichment experiences are defined as planned opportunities beyond regular classroom work designed to extend and add depth to your child's education. Examples include speakers, videos, and interest-based activities.

1. My child has opportunities for enrichment experiences in school. 1 2 3 4 5
2. During school, my child is encouraged to develop and pursue his or her talents. 1 2  
3 4 5
3. My child develops projects in the classroom that reflect her or his interests. 1 2 3 4  
5
4. My child has opportunities to work with other students in his or her classroom who share common interests. 1 2 3 4 5
5. My child's school offers enrichment opportunities for all students. 1 2 3 4 5
6. My child enjoys the enrichment opportunities in his or her school or classroom. 1 2  
3 4 5



7. My child is happy about attending school. 1 2 3 4 5
8. I am informed about the educational enrichment activities for my child at school. 1  
2 3 4 5
9. I have the opportunity to become involved with enrichment opportunities in school.  
1 2 3 4 5
10. I am satisfied with enrichment experiences my child receives at school. 1 2 3 4 5

Please comment briefly on the following items:

1. What do you like most about your child's school experience?
2. What changes would you like to see made regarding your child's school or classroom experiences?
3. Please provide other comments that will help us understand your attitude toward school and satisfaction with your child's experience in his or her classroom or school.

## Appendix I

### Week One Lesson Plan

**Name:** Madison Cunningham

**Date:** November 11, 2015

**Title/Subject:** Introduction to Project eXtreme Club

**Grade Level:** Mixed grades

**Standards Addressed:**

NGSS

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

**Learning Goals:** (What is it that you want your students to ***KNOW, UNDERSTAND, and BE ABLE TO DO*** as a result of this lesson?)

<p><b>Understand</b> (<i>big ideas, principles, generalizations, rules, the “point” of the discipline or topic within the discipline, always a complete sentence: The students will understand that...</i>)</p> <ul style="list-style-type: none"> <li>• Humans think creatively as a way to come up with new ideas and processes.</li> <li>• We must know one another and work with one another to come up with new ideas.</li> </ul>	
<p><b>Know</b> (<i>facts, vocabulary, how-to's, information that is memorizable</i>)</p> <ul style="list-style-type: none"> <li>• How to build a tower out of spaghetti and tape</li> <li>• Engineering concepts</li> <li>• How to problem solve using a design method</li> </ul>	<p><b>Do (Skills)</b> (<i>thinking skills, skills of the discipline—skills you will assess-not an activity</i>)</p> <ul style="list-style-type: none"> <li>• SWBAT...Problem solve</li> <li>• SWBAT...Think creatively</li> </ul>

**Differentiation:** (By process, product, or learning environment? By readiness, learning profile, interest or affect? What will it look like? What was the basis behind the formation of your groups etc.?)

- Could differentiate groups in this lesson
- Could possibly differentiate based on who needs assistance, etc.

**Materials:**

- Ball with questions written on it
- Surveys for students to fill out
- Spaghetti noodles
- Golf balls

- Masking tape

**Procedures:** (List a step-by-step detailed plan of what will happen in the lesson using the headings below. If you are working with students in small groups, describe each group's lesson. Decide the method you will use to assist students in coming to understand the content? Think in advance of higher order questions you may ask. What are some of the misconceptions that may occur? Begin with schema activation (the set) and end with closure (reviewing the purpose of the lesson and what was learned).

**\*Schema Activation:** (Engages prior knowledge and builds interest. How will you "hook" the students? This should be short and not require new learning on the part of the students.)

- At the beginning of the club, we will discuss what the club is about and expectations.
- Students will complete a short survey about what they want to learn and do in "Project eXtreme."
- We (as a group) will play with the "Toss-n-Talk" ball (a ball with get to know you questions written all over it; when tossed, you answer the question that your right thumb lands on).
- Then, we will move into the day's activity: tower building. We will discuss different types of structures, what makes a structure good/bad, and how we go about making a structure.
- The challenge will then be presented.

**\*Process:** What will you do? What will your teaching look like? What will you and your students do together? What will students do independently to show understanding and mastery of the concept?

- Students will be given a STEM challenge to build a tower out of spaghetti noodles that holds the weight of a golf ball. The challenge is meant to teach creative thinking, problem solving, and thinking "outside the box."
- Students will complete the STEM challenge in pairs. (Could be modified to fit the group)

**\*Closure:** (Ties the lesson together. How will you summarize what was accomplished in the lesson?)

- We will discuss what students did, how they built their towers, etc.
- We will discuss what worked and what did not work in the tower-building process.
- Students' towers will be evaluated based on whether or not the golf ball could be supported and the overall height of the tower.

**Evaluation:** (What assessment strategy was used to determine if your goals were accomplished? Were the learning goals obtained? How do you know? Did you find that the lesson was too easy or too difficult for some students?)

- Students will be evaluated on a continual, running record basis. I will keep records of my students and their progress.

**Reflection on the Lesson:** (Introspection! What worked? What didn't? What would you do differently next time? Also discuss what you learned from your assessment data. This section can only be completed after the lesson is taught.)

## Appendix J

### Week Two Lesson Plan

**Name:** Madison Cunningham

**Date:** November 18, 2015

**Title/Subject:** Project eXtreme: Ice Cream Time! **Grade Level:** Mixed grades

**Standards Addressed:**

NGSS

2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

2-PS1-4: Construct and argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

5-PS1-4: Conduct and investigation to determine whether the mixing of two or more substances results in new substances.

**Learning Goals:** (What is it that you want your students to ***KNOW, UNDERSTAND, and BE ABLE TO DO*** as a result of this lesson?)

<p><b>Understand</b> (<i>big ideas, principles, generalizations, rules, the “point” of the discipline or topic within the discipline, always a complete sentence: The students will understand that...</i>)</p> <ul style="list-style-type: none"> <li>• Some materials have different freezing points than others.</li> <li>• We must know one another and work with one another to come up with new ideas.</li> </ul>	
<p><b>Know</b> (<i>facts, vocabulary, how-to’s, information that is memorizable</i>)</p> <ul style="list-style-type: none"> <li>• How to make homemade ice cream</li> <li>• How the freezing of ice cream works</li> </ul>	<p><b>Do (Skills)</b> (<i>thinking skills, skills of the discipline—skills you will assess-not an activity</i>)</p> <ul style="list-style-type: none"> <li>• SWBAT... Create a new product using both a recipe and creative thinking skills</li> <li>• SWBAT...Think creatively</li> </ul>

**Differentiation:** (By process, product, or learning environment? By readiness, learning profile, interest or affect? What will it look like? What was the basis behind the formation of your groups etc.?)

- Could differentiate groups in this lesson
- Could possibly differentiate based on who needs assistance, etc.

**Materials:**

- Homemade ice cream recipe
- Kosher salt
- Ice
- Sugar
- Half and Half

- Vanilla Extract
- Gallon size Ziploc bags
- Quart size Ziploc bags
- Any other flavor extracts for students to create their own flavor

**Procedures:** (List a step-by-step detailed plan of what will happen in the lesson using the headings below. If you are working with students in small groups, describe each group's lesson. Decide the method you will use to assist students in coming to understand the content? Think in advance of higher order questions you may ask. What are some of the misconceptions that may occur? Begin with schema activation (the set) and end with closure (reviewing the purpose of the lesson and what was learned).

**\*Schema Activation:** (Engages prior knowledge and builds interest. How will you "hook" the students? This should be short and not require new learning on the part of the students.)

- At the beginning of the club, we will review what the club is about and expectations.
- We (as a group) will play a human scavenger hunt game to continue to get to know one another. We will continue to get to know each other.
- Then, we will move into the day's activity: ice cream making. We will discuss different flavors of ice cream, how it is made, freezing points, etc.
- The challenge will then be presented.

**\*Process:** What will you do? What will your teaching look like? What will you and your students do together? What will students do independently to show understanding and mastery of the concept?

- Use the site (<http://www.acs.org/content/acs/en/education/whatischemistry/adventures-in-chemistry/secret-science-stuff/ice-cream.html>) information to discuss the science behind ice cream.
- Students will work together to make ice cream from the given ingredients and Ziploc bags.
- Before beginning, students will discuss what flavors they would invent for ice cream, using the given ingredients.
- They will make 3 separate batches. One vanilla, following the exact recipe given, and two of their own flavor invention.

**\*Closure:** (Ties the lesson together. How will you summarize what was accomplished in the lesson?)

- We will discuss what students did, how they made their ice cream, etc.
- We will discuss what worked and what did not work in the ice cream making process.
- Students will taste test the various types of ice cream they created/designed.

**Evaluation:** (What assessment strategy was used to determine if your goals were accomplished? Were the learning goals obtained? How do you know? Did you find that the lesson was too easy or too difficult for some students?)

- Students will be evaluated on a continual, running record basis. I will keep records of my students and their progress.

**Reflection on the Lesson:** (Introspection! What worked? What didn't? What would you do differently next time? Also discuss what you learned from your assessment data. This section can only be completed after the lesson is taught.)

## Homemade Vanilla Ice Cream Recipe

### Ingredients:

Ice

1 cup Kosher/Coarse Salt

4 Tbsp. Sugar

2 Cups Half & Half

1 Tsp. Vanilla Extract

Gallon-Size Ziploc Bag

Quart-Size Ziploc Bag

1. Mix Sugar, Half & Half and Vanilla Extract and pour into a quart-size Ziploc bag. (We also made a batch of strawberry ice cream using the same ingredients and adding an additional tbsp. of sugar and 3/4 cup fresh strawberries and blending).
2. Place Ice and 1/2 cup of coarse salt in gallon-size Ziploc bag, place bag of ingredients on top of ice. Pour more ice and remainder 1/2 cup of salt and seal bag.

**SHAKE-SHAKE-SHAKE 7-10 minutes  
ICE CREAM!**



# Design Your Own Ice Cream Flavor

What do you need for this flavor?  
What amounts of ingredients?



Name: \_\_\_\_\_

# Human Scavenger Hunt!

Get to Know Your New Buddies

<p>Has been out of the country:</p> <p>_____</p>	<p>Has a pet that isn't a dog or a cat:</p> <p>_____</p>	<p><b>LOVES SCIENCE:</b></p> <p>_____</p>	<p>Favorite subject is math:</p> <p>_____</p>
<p>Had a birthday within the last week:</p> <p>_____</p>	<p>Has visited Washington, D.C.</p> <p>_____</p>	<p>Has a brother or a sister that goes to this school:</p> <p>_____</p>	<p>loves to cook:</p> <p>_____</p>
<p><b>PLAYS A SPORT:</b></p> <p>_____</p>	<p>Favorite color is yellow:</p> <p>_____</p>	<p>Was born in another state:</p> <p>_____</p>	<p>Read more than 1 book this summer:</p> <p>_____</p>
<p><b>LOVES TO DRAW OR PAINT:</b></p> <p>_____</p>	<p>Has met someone famous</p> <p>_____</p>	<p>Has won a contest of some kind:</p> <p>_____</p>	<p>plays an instrument:</p> <p>_____</p>
<p>Has done something adventurous:</p> <p>_____</p>	<p>is an only child</p> <p>_____</p>	<p>Loves Broccoli</p> <p>_____</p>	<p>Has been to the Statue of Liberty:</p> <p>_____</p>

## Appendix K

### Week Three Lesson Plan

**Name:** Madison Cunningham

**Date:** December 2nd, 2015

**Title/Subject:** Project eXtreme: SLIME TIME!

**Grade Level:** Mixed grades

**Standards Addressed:**

CCSS.MATH.CONTENT.3.MD.A.2

Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.2

STL

Standard 1C: Things that are found in nature differ from things that are human-made in how they are produced and used.

Standard 2J: Materials have many different properties.

Standard 4B: When using technology, results can be good or bad.

**Learning Goals:** (What is it that you want your students to ***KNOW, UNDERSTAND, and BE ABLE TO DO*** as a result of this lesson?)

**Understand** (*big ideas, principles, generalizations, rules, the “point” of the discipline or topic within the discipline, always a complete sentence: The students will understand that...*)

- Measurement can involve measuring liquids.
- We must know one another and work with one another to come up with new ideas.
- Materials have different properties.

**Know** (*facts, vocabulary, how-to’s, information that is memorizable*)

- How to make slime
- How the different ingredients affect the outcome differently

**Do (Skills)** (*thinking skills, skills of the discipline—skills you will assess-not an activity*)

- SWBAT... Create a new product using both a recipe and creative thinking skills
- SWBAT...Think creatively

**Differentiation:** (By process, product, or learning environment? By readiness, learning profile, interest or affect? What will it look like? What was the basis behind the formation of your groups etc.?)

- Could differentiate groups in this lesson
- Could possibly differentiate based on who needs assistance, etc.

**Materials:**

- Slime materials based on recipe

- Loose glitter to put in slime (optional per group)

**Procedures:** (List a step-by-step detailed plan of what will happen in the lesson using the headings below. If you are working with students in small groups, describe each group's lesson. Decide the method you will use to assist students in coming to understand the content? Think in advance of higher order questions you may ask. What are some of the misconceptions that may occur? Begin with schema activation (the set) and end with closure (reviewing the purpose of the lesson and what was learned).

**\*Schema Activation:** (Engages prior knowledge and builds interest. How will you "hook" the students? This should be short and not require new learning on the part of the students.)

- At the beginning of the club, we will review what the club is about and expectations.
- We (as a group) will play a "Clue" game to continue to get to know one another. We will continue to get to know each other.
- For the "Clue" game, students will write their answers to various questions on an index card, and then hand them all in to the middle of the circle. Take turns guessing whose card is being read.
- Then, we will move into the day's activity: slime making.
- The challenge will then be presented.

**\*Process:** What will you do? What will your teaching look like? What will you and your students do together? What will students do independently to show understanding and mastery of the concept?

- Students will work together in teams to make slime from the given ingredients and recipes.
- Each group will be given a different slime recipe. It is up to them to follow the recipe.
- Students can decide their own slime color.
- Students will compare the recipes using descriptive language.

**\*Closure:** (Ties the lesson together. How will you summarize what was accomplished in the lesson?)

- We will discuss what students did, how they made their slime, etc.
- We will discuss what worked and what did not work in the slime making process.
- Students will view and touch the various types of slime they created/designed.
- Students will be able to take some of their slime creation home with them.

**Evaluation:** (What assessment strategy was used to determine if your goals were accomplished? Were the learning goals obtained? How do you know? Did you find that the lesson was too easy or too difficult for some students?)

- Students will be evaluated on a continual, running record basis. I will keep records of my students and their progress.

**Reflection on the Lesson:** (Introspection! What worked? What didn't? What would you do differently next time? Also discuss what you learned from your assessment data. This section can only be completed after the lesson is taught.)

## Slime Recipe #1

### Ingredients

1 tbsp of Metamucil with Psyllium (generic fiber supplement will also work as long as it contains psyllium)

1 cup of water

Food dye for coloring

### Instructions

Make sure that the Metamucil you are using contains psyllium. You can also use a generic fiber brand as long as it has psyllium.

In a LARGE microwaveable bowl combine 1 tablespoon of Metamucil or similar with 1 cup of water and stir well. You can also add a few drops of food coloring for rich coloring.

Stir the ingredients until everything is dissolved

Then place the bowl in the microwave and heat on high until you start to see bubbles (roughly 2 minutes). Continue to microwave the bubbling slime for one minute. Then stop the microwave & stir.

Once stirred microwave again for two more minutes.

Remove the bowl from the microwave and allow it to cool. At this point the slime will still be liquid, but it will thicken as it cools. Once it is completely cool it will be ready for play!

## Slime Recipe #2

1. Stir together 1 teaspoon of Borax and 1 cup of water in the smallest bowl.



2. Empty all the glue in the biggest bowl.



3. Fill the empty glue bottle with water and pour it into the bowl.



4. Add color to the bowl and stir.



5. Add the Borax mixture and stir.



6. You have slime! You can touch it with your hands, and pour out any extra water.





### Slime Recipe #3

#### Ingredients

1 bottle of Elmer's Clear School Glue (5 oz)

1/2-3/4 cup Sta-Flo Liquid Starch (at Walmart)

Liquid food coloring (several squirts until you get the desired color)

Fine glitter in a variety of colors

#### Instructions

Put your glue into a bowl first. Then add your coloring and glitter and mix well.

THEN you can start adding your starch, but just add it in small increments at a time, stirring well to mix after each one to incorporate your starch fully.

After the first couple of additions you'll need to use your hands to knead the starch in, just like you are making bread dough.

Another thing- I know the common wisdom is equal parts starch and glue, but I never needed the entire amount of starch.

When I did use the entire 3/4-cup of starch, it wasn't as stretchy as I wanted.

So, just add a little at a time and do a "stretch test" after each increment is kneaded in. Once your slime is the consistency you prefer, STOP!

## Appendix L

### Weeks Four and Five Lesson Plan

**Name:** Madison Cunningham

**Date:** December 9 & 16, 2015

**Title/Subject:** Project eXtreme: Gingerbread Structure **Grade Level:** Mixed grades

**Standards Addressed:**

NGSS

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

**Learning Goals:** (What is it that you want your students to ***KNOW, UNDERSTAND, and BE ABLE TO DO*** as a result of this lesson?)

<p><b>Understand</b> (<i>big ideas, principles, generalizations, rules, the “point” of the discipline or topic within the discipline, always a complete sentence: The students will understand that...</i>)</p> <ul style="list-style-type: none"> <li>• Structures are made using various pieces.</li> <li>• There are different ways to make structures strong.</li> <li>• History of gingerbread house.</li> </ul>	
<p><b>Know</b> (<i>facts, vocabulary, how-to's, information that is memorizable</i>)</p> <ul style="list-style-type: none"> <li>• How to create a gingerbread house</li> <li>• How structures are supported</li> </ul>	<p><b>Do (Skills)</b> (<i>thinking skills, skills of the discipline—skills you will assess-not an activity</i>)</p> <ul style="list-style-type: none"> <li>• SWBAT... Create a gingerbread structure out of materials</li> <li>• SWBAT...Think creatively</li> </ul>

**Differentiation:** (By process, product, or learning environment? By readiness, learning profile, interest or affect? What will it look like? What was the basis behind the formation of your groups etc.?)

- Could differentiate groups in this lesson
- Could possibly differentiate based on who needs assistance, etc.

**Materials:**

- Graham crackers (for gingerbread)
- Icing
- Assorted candy
- Cardboard base for the structure

**Procedures:** (List a step-by-step detailed plan of what will happen in the lesson using the headings below. If you are working with students in small groups, describe each group's lesson. Decide the method you will use to assist students in coming to understand the

content? Think in advance of higher order questions you may ask. What are some of the misconceptions that may occur? Begin with schema activation (the set) and end with closure (reviewing the purpose of the lesson and what was learned).

**\*Schema Activation:** (Engages prior knowledge and builds interest. How will you “hook” the students? This should be short and not require new learning on the part of the students.)

- At the beginning of the club, we will review what the club is about and expectations.
- We (as a group) will play with the “Toss n Talk Ball” in order to further get to know each other.
- The challenge will then be presented.

**\*Process:** What will you do? What will your teaching look like? What will you and your students do together? What will students do independently to show understanding and mastery of the concept?

- Students will work together as an entire group to create a thoughtful, well-planned gingerbread structure.

**\*Closure:** (Ties the lesson together. How will you summarize what was accomplished in the lesson?)

- We will discuss what students did, how they have begun their gingerbread structure, etc.
- We will discuss what works and does not work in the gingerbread structure making process.
- Students will view and critique the structure they created/designed.

**Evaluation:** (What assessment strategy was used to determine if your goals were accomplished? Were the learning goals obtained? How do you know? Did you find that the lesson was too easy or too difficult for some students?)

- Students will be evaluated on a continual, running record basis. I will keep records of my students and their progress.

**Reflection on the Lesson:** (Introspection! What worked? What didn’t? What would you do differently next time? Also discuss what you learned from your assessment data. This section can only be completed after the lesson is taught.)

Pictures of Gingerbread Structures





## Appendix M

### Week Six Lesson Plan

**Name:** Madison Cunningham

**Date:** January 27, 2016

**Title/Subject:** Project eXtreme: Pizza Time!

**Grade Level:** Mixed grades

**Standards Addressed:**

CCSS.MATH.CONTENT.3.NF.A.1

Understand a fraction  $1/b$  as the quantity formed by 1 part when a whole is partitioned into  $b$  equal parts; understand a fraction  $a/b$  as the quantity formed by  $a$  parts of size  $1/b$ .

CCSS.MATH.CONTENT.3.NF.A.3

Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

**Learning Goals:** (What is it that you want your students to ***KNOW, UNDERSTAND, and BE ABLE TO DO*** as a result of this lesson?)

<p><b>Understand</b> (<i>big ideas, principles, generalizations, rules, the “point” of the discipline or topic within the discipline, always a complete sentence: The students will understand that...</i>)</p> <ul style="list-style-type: none"> <li>You can divide a pizza (or another food item) into fractions.</li> <li>There are different ways to make a pizza, based on preferences and other variables.</li> </ul>	
<p><b>Know</b> (<i>facts, vocabulary, how-to’s, information that is memorizable</i>)</p> <ul style="list-style-type: none"> <li>How to make a pizza</li> <li>How fractions could be represented via a pizza</li> </ul>	<p><b>Do (Skills)</b> (<i>thinking skills, skills of the discipline—skills you will assess-not an activity</i>)</p> <ul style="list-style-type: none"> <li>SWBAT... make a personal pan pizza out of given materials</li> <li>SWBAT...problem solve in the form of dividing the pizza into fractions</li> </ul>

**Differentiation:** (By process, product, or learning environment? By readiness, learning profile, interest or affect? What will it look like? What was the basis behind the formation of your groups etc.?)

- Could differentiate groups in this lesson
- Could possibly differentiate based on who needs assistance, etc.

**Materials:**

- Pizza dough
- Pizza sauce
- Pepperoni
- Plastic knives (to cut pizzas)
- Baking sheets

**Procedures:** (List a step-by-step detailed plan of what will happen in the lesson using the headings below. If you are working with students in small groups, describe each group's lesson. Decide the method you will use to assist students in coming to understand the content? Think in advance of higher order questions you may ask. What are some of the misconceptions that may occur? Begin with schema activation (the set) and end with closure (reviewing the purpose of the lesson and what was learned).

**\*Schema Activation:** (Engages prior knowledge and builds interest. How will you "hook" the students? This should be short and not require new learning on the part of the students.)

- At the beginning of the club, we will review what the club is about and expectations.
- We (as a group) will play the "Maitre'd" game:
  - Students are to get in a "party of..." based on a number I say, and then discuss a particular question of my choice.
  - Example: Party of 3, and what is your favorite childhood memory and why?
- The activity will then be presented.

**\*Process:** What will you do? What will your teaching look like? What will you and your students do together? What will students do independently to show understanding and mastery of the concept?

- Students will work on individual pan pizzas in a group setting.
- After the pizzas are done baking, students will then discuss fractions, and how we divide pizzas up into slices.
- Students will be asked to divide their own pizzas based on a fraction of my choosing, and eat that particular fraction. (I.e. cut your pizza into sixths, and eat 2/6ths of your pizza)

**\*Closure:** (Ties the lesson together. How will you summarize what was accomplished in the lesson?)

- We will discuss what students did, how they made their pizzas and divided them up.
- We will discuss what works and does not work in the fraction process.
- Students will view and critique their own pizza creation.

**Evaluation:** (What assessment strategy was used to determine if your goals were accomplished? Were the learning goals obtained? How do you know? Did you find that the lesson was too easy or too difficult for some students?)

- Students will be evaluated on a continual, running record basis. I will keep records of my students and their progress.

**Reflection on the Lesson:** (Introspection! What worked? What didn't? What would you do differently next time? Also discuss what you learned from your assessment data. This section can only be completed after the lesson is taught.)

## Appendix N

### Week Seven Lesson Plan

**Name:** Madison Cunningham

**Date:** February 3, 2016

**Title/Subject:** Project eXtreme: Volcano Research

**Grade Level:** Mixed grades

**Standards Addressed:**

CCSS.ELA-LITERACY.RI.3.5

Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

CCSS.ELA-LITERACY.RI.3.4

Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area

4-ESS2-2.

Analyze and interpret data from maps to describe patterns of Earth's features.

[Clarification Statement: Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.]

**Learning Goals:** (What is it that you want your students to ***KNOW, UNDERSTAND, and BE ABLE TO DO*** as a result of this lesson?)

<p><b>Understand</b> (<i>big ideas, principles, generalizations, rules, the “point” of the discipline or topic within the discipline, always a complete sentence: The students will understand that...</i>)</p> <ul style="list-style-type: none"> <li>• How a volcano works</li> <li>• The definition of a volcano</li> <li>• How to represent a volcano with a model</li> </ul>	
<p><b>Know</b> (<i>facts, vocabulary, how-to's, information that is memorizable</i>)</p> <ul style="list-style-type: none"> <li>• How to construct a model volcano</li> <li>• How to research various concepts online</li> <li>• How a volcano functions</li> </ul>	<p><b>Do (Skills)</b> (<i>thinking skills, skills of the discipline—skills you will assess-not an activity</i>)</p> <ul style="list-style-type: none"> <li>• SWBAT... research using iPads</li> <li>• SWBAT...demonstrate how a volcano works using a model</li> </ul>

**Differentiation:** (By process, product, or learning environment? By readiness, learning profile, interest or affect? What will it look like? What was the basis behind the formation of your groups etc.?)

- Could differentiate groups in this lesson
- Could possibly differentiate based on who needs assistance, etc.

**Materials:**

- Paper
- Writing utensils



- iPads

**Procedures:** (List a step-by-step detailed plan of what will happen in the lesson using the headings below. If you are working with students in small groups, describe each group's lesson. Decide the method you will use to assist students in coming to understand the content? Think in advance of higher order questions you may ask. What are some of the misconceptions that may occur? Begin with schema activation (the set) and end with closure (reviewing the purpose of the lesson and what was learned).

**\*Schema Activation:** (Engages prior knowledge and builds interest. How will you "hook" the students? This should be short and not require new learning on the part of the students.)

- At the beginning of the club, we will review what the club is about and expectations.
- We (as a group) will play the "Maitre'd" game:
  - Students are to get in a "party of..." based on a number I say, and then discuss a particular question of my choice.
  - Example: Party of 3, and what is your favorite childhood memory and why?
- The activity will then be presented.

**\*Process:** What will you do? What will your teaching look like? What will you and your students do together? What will students do independently to show understanding and mastery of the concept?

- Students will work together using iPads to research volcanoes.
- Students will also work together to research how to make a model of a volcano that works.
- Students will collaborate on which model would work the best.

**\*Closure:** (Ties the lesson together. How will you summarize what was accomplished in the lesson?)

- We will discuss what students researched, and how they want to go about constructing their volcanoes.
- We will discuss what worked and did not work in the research process.
- Students will view and critique their own research.
- Students will discuss as a group what they learned about volcanoes in general.

**Evaluation:** (What assessment strategy was used to determine if your goals were accomplished? Were the learning goals obtained? How do you know? Did you find that the lesson was too easy or too difficult for some students?)

- Students will be evaluated on a continual, running record basis. I will keep records of my students and their progress.

**Reflection on the Lesson:** (Introspection! What worked? What didn't? What would you do differently next time? Also discuss what you learned from your assessment data. This section can only be completed after the lesson is taught.)

## Appendix O

### Weeks Eight Through Ten Lesson Plans

**Name:** Madison Cunningham

**Dates:** February 10,17, 24, 2016

**Title/Subject:** Project eXtreme: Volcano Model Building

**Grade Level:** Mixed grades

**Standards Addressed:**

NGSS

2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

2-ESS2-2: Develop a model to represent the shapes and kinds of land and bodies of water in an area.

4-ESS3-2: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

**Learning Goals:** (What is it that you want your students to ***KNOW, UNDERSTAND, and BE ABLE TO DO*** as a result of this lesson?)

<p><b>Understand</b> (<i>big ideas, principles, generalizations, rules, the “point” of the discipline or topic within the discipline, always a complete sentence: The students will understand that...</i>)</p> <ul style="list-style-type: none"> <li>• How a volcano works</li> <li>• How to represent a volcano with a model</li> </ul>	
<p><b>Know</b> (<i>facts, vocabulary, how-to's, information that is memorizable</i>)</p> <ul style="list-style-type: none"> <li>• How to construct a model volcano</li> <li>• How a volcano functions</li> </ul>	<p><b>Do (Skills)</b> (<i>thinking skills, skills of the discipline—skills you will assess-not an activity</i>)</p> <ul style="list-style-type: none"> <li>• SWBAT... construct a model volcano</li> <li>• SWBAT...demonstrate how a volcano works using a model</li> </ul>

**Differentiation:** (By process, product, or learning environment? By readiness, learning profile, interest or affect? What will it look like? What was the basis behind the formation of your groups etc.?)

- Could differentiate groups in this lesson
- Could possibly differentiate based on who needs assistance, etc.

**Materials:**

- Empty plastic 2-liter bottle or jug
- Newspaper
- Flour & Water (for glue solution)
- Paint
- Cardboard base for model

- Vinegar
- Red food dye
- Water
- Baking soda
- Dishwashing liquid soap
- Funnel for vinegar, etc. (?)

**Procedures:** (List a step-by-step detailed plan of what will happen in the lesson using the headings below. If you are working with students in small groups, describe each group's lesson. Decide the method you will use to assist students in coming to understand the content? Think in advance of higher order questions you may ask. What are some of the misconceptions that may occur? Begin with schema activation (the set) and end with closure (reviewing the purpose of the lesson and what was learned).

**\*Schema Activation:** (Engages prior knowledge and builds interest. How will you "hook" the students? This should be short and not require new learning on the part of the students.)

- At the beginning of the club, we will review what the club is about and expectations.
- We (as a group) will talk and discuss the day's happenings. We will talk about procedures related to the volcano model building.
- The activity will then be presented.

**\*Process:** What will you do? What will your teaching look like? What will you and your students do together? What will students do independently to show understanding and mastery of the concept?

- The first week, the students will construct the model volcano using the jug, newspaper, cardboard, and glue solution.
- The model is paper mache.
- The second week, the students will paint the paper mache model. At this point, the paper mache model will have dried completely after sitting in the open for a week.
- The third and final week, the students will conduct an experiment with the model involving fake "lava" coming out of the model volcano vent.
  - For the lava, students will need:
    - Baking soda
    - Warm water
    - Dishwashing liquid
    - Red food coloring (optional)
    - Vinegar
  - Directions for "lava" found on Science Illustrated website
  - Students will need to fill the empty bottle with warm water, leaving just a few cm of air.
  - Add a few drops of red food coloring.
  - Add 6 drops of dishwashing liquid to the bottle.
  - Use the funnel to add 2 tablespoons of baking soda to the bottle.

- Clean the funnel of baking soda and use it to pour  $\frac{1}{4}$  cup of vinegar into the bottle. Stand back, and it should explode.
- Explosion could probably be done more than once, time provided.
- After clean up, gather students, and begin closing discussion.

**\*Closure:** (Ties the lesson together. How will you summarize what was accomplished in the lesson?)

- We will discuss what students learned from the volcano model-building experience.
- We will discuss what worked and did not work in the research process as well as the model building.
- Students will view and critique their own research and model.
- Students will discuss as a group what they learned about volcanoes in general.
- Students will discuss what they learned about volcanoes from the culminating lava explosion experiment.
- Students will complete the 10<sup>th</sup> session of the club by filling out the post survey.

**Evaluation:** (What assessment strategy was used to determine if your goals were accomplished? Were the learning goals obtained? How do you know? Did you find that the lesson was too easy or too difficult for some students?)

- Students will be evaluated on a continual, running record basis. I will keep records of my students and their progress.

**Reflection on the Lesson:** (Introspection! What worked? What didn't? What would you do differently next time? Also discuss what you learned from your assessment data. This section can only be completed after the lesson is taught.)

**Appendix P**  
**T-Test Results**

t-Test: Two-Sample Assuming Unequal Variances		
	<i>Pre-Assessment</i>	<i>Post-Assessment</i>
Mean	22.7	21.28571429
Variance	2.011111111	1.238095238
Observations	10	7
Pooled Variance	1.701904762	
Hypothesized Mean Difference	0	
df	15	
t Stat	2.30039109	
P(T<=t) one-tail	0.021953855	
t Critical one-tail	1.753050356	
P(T<=t) two-tail	0.03619693	
t Critical two-tail	2.13144955	