INCREASING STUDENT ACHIEVEMENT IN SCIENCE BY IMPROVING SCIENCE VOCABULARY IN THE ELEMENTARY GRADES

by

Alisha Nicole Pablo

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Alisha Pablo

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ABSTRACT

How can understanding science vocabulary help students understand science content better? Can more exposure to science vocabulary increase students' knowledge of science topics? These are the questions that I addressed in my capstone. During the treatment students used different strategies to help them understand their science vocabulary. They worked throughout the two units using these ways to better understand science.

INTRODUCTION AND BACKGROUND

Hot Springs School District is located at the western end of the Flathead Indian Reservation in Hot Springs, Montana. My school, Hot Springs Elementary, is a K-6 school with 110 students. Of our 110 students, 25 % are Native American, and 70 % are on free and reduced lunch. Hot Springs is a high poverty town in Sanders County, which has the highest unemployment rate per capita in Montana at 21.42%, as well as extremely high bankruptcy and foreclosure rates (S. Estill, personal communication, October 10, 2010; missoulian.com, April 2, 2011).

This action research project was conducted with third grade students from Hot Springs Schools. My 3rd grade class consisted of 18 students, 10 girls and 8 boys. There were five Native Americans, one Pacific Island student, one Latino and eleven Caucasian students. Generally, the students in this class had short attention spans and their academic abilities were lower than a third grade level.

During the study period we were just starting a new science curriculum from National Geographic. Vocabulary has always been a weak area for my students and I wanted to observe and get a better idea of why and how teaching vocabulary strategies can improve students' learning. Every subject in the science curriculum includes vocabulary words students need to know to ensure complete knowledge of the subject. However, the National Geographic curriculum only includes one strategy to introduce the new words to students. With all types of learners in the class, I felt I needed all types of strategies to teach vocabulary. Changes and adjustments were made throughout the action research process to make vocabulary achievement a success.

The purpose of this action research was to observe student achievement in science based on a range of vocabulary teaching strategies. Our school has been experiencing low standardized test scores. I wanted to see if by developing my students' vocabulary background, their content knowledge would increase. I was also hoping that a better vocabulary would increase science understanding and result in better test scores. My goal with this action research project was to take the challenging vocabulary words, break them down, and teach them in a way that students could understand and use them in their writing to explain science. My focus question asked: *If students improved their understanding of science vocabulary would their science knowledge also improve?* My secondary question asked: *Can more exposure to science vocabulary increase students' knowledge of science topics?*

CONCEPTUAL FRAMEWORK

Vocabulary acquisition is one of the most essential skills to learning. If you don't understand word meanings, understanding content can be very difficult in science. Typically, students are expected to read a textbook and instantly know what the particular text is talking about. Without knowing what the vocabulary means, students will have difficulty mastering their content material (Donnelly & Roe, 2010; Fisher, Grant, & Frey, 2009; Glen & Dotger, 2009; Kinniburgh & Shaw, 2007; Young, 2005).

Teaching students the correct vocabulary strategies can increase their knowledge and interest in science language. This helps close the gap between new science content and background knowledge students bring into the classroom. Vocabulary instruction should not just be expected in English class, but in every content area (Blachowicz &

Fisher, 2002). When students read a science textbook they are expected to know what the words mean. Without background knowledge of a certain topic, students' understanding of vocabulary is hindered. By using certain strategies, students' comprehension of the text, vocabulary, as well as key concepts will increase dramatically. Ways to increase students' vocabulary include contextualizing word meanings, establishing relationships between terms and providing multiple exposures to and usage of words (Gunning, 1998). Contextualizing word meanings is to use the vocabulary words in real life science-area contexts. In order to establish relationships a teacher needs to help students realize how new vocabulary words relate to old vocabulary words. Multiple exposures are provided by using vocabulary in different ways that enables the use of things such as context clues, analogies, or word parts. It is important to develop students' vocabulary understanding of four core types of vocabulary: listening vocabulary, speaking vocabulary, reading vocabulary, and writing vocabulary (Ambruster & Osborn, 2001). These are all needed in students' science lessons at different times. Students will need listening vocabulary when they are required to understand the words they hear, speaking vocabulary when they speak, reading vocabulary in order to understand what they read, and writing vocabulary when students are writing about science topics.

When students are engaged, they learn from their instructional materials better (Bost & Riccomini, 2006). By using small white boards during vocabulary instruction, for example, students are more likely to stay engaged, less likely to misbehave, which in turn aids them in understanding the material being presented (Heward et al., 1996). Numerous researchers agree that by keeping all students engaged at once, learning will

increase. Likewise, with response cards students will respond more frequently and accurately, increase their test scores, and decrease their behavior problems (Maheady, Michielli Pendl, Mallette, & Harper, 2002; Narayan, Heward, & Gardner, 1990; Armendariz & Umbreit, 1999). In a study conducted with five low-achieving students, it was found that by using response cards in the classroom students were actively engaged in learning and received more feedback from the teacher because the strategy freed up the teacher to respond to each of the students thus allowing the students to know if their answer was correct or incorrect. Response cards could be another strategy for increasing science vocabulary and content knowledge.

Background knowledge and knowledge of vocabulary is said to also increase achievement. Using vocabulary instruction and building background knowledge, students will be able to absorb content better (Fisher, Grant & Frey, 2009). This may be especially important in science since, in many schools across the nation, students are underachieving in science content. Eighty two percent of the nation's seniors were below proficient on the 2000 NAEP science test, for example. "The longer the students stay in the current system the worse they do." According to the 1995 Third International Mathematics and Science study, U.S. fourth graders ranked second in math compared to other countries. By 12th grade, they fall to 16th, behind nearly every industrialized rival and ahead of only Cyprus and South Africa (U.S. Department of Education, p.183). With this in mind, the nation needs to move their focus to include science instruction as one of their main targets. Because reading proficiency and command of vocabulary are integral to science achievement, this move should include a variety of literacy based instructional strategies, including having students read from a variety of texts chosen by the teacher.

The teacher must keep in mind the level of his/her students because students cannot learn much by reading a text they do not understand. Through the use of these strategies, teachers build their students' background knowledge.

To increase mastery of vocabulary, students should learn words inside and out by using five different strategies. First, make it intentional. Beck, McKeown, and Kucan (2002) identify science terminology in three categories they call Tier words. Words in Tier 1 are basic words used in talking about science. Tier 2 words are words that have different meanings when used in different settings. They are also called specialized words. In Tier 3, students will see technical science terms. When teachers plan their lessons around specific words, then their instruction is considered intentional.

The second strategy simply states to make it transparent. Teachers must model how to figure out what words mean to assure students that they can do this for themselves. Teachers should teach the use of context clues, prefixes, suffixes, and roots as well as outside resources to help students understand new words.

Another strategy is to make words usable. After students learn their new vocabulary words, they need to use them in their conversations and writing. Jig-saw, reciprocal teaching, and word mapping, which all include students' use of vocabulary with their classmates, are all strategies to increase vocabulary usage (Brassell, 2008). Other ideas may include using Think-Pair-Share groups or 4-3-2-1 groups where students think about what they learned then turn to discuss with a group or partner about their findings.

Next, teachers should make words personal by providing students with opportunities to use them in applying their new knowledge. A common method for doing

this is through the use of generative sentences. Students are given a word, a position to put it in a sentence, and the expected length of sentence. An example might be using the term "thrust faults" in the third or fourth position using at least eight words. One student wrote, "There are thrust faults in Los Angeles because the San Andreas Fault bends to the west." Other ideas include word sorts and journals.

The final strategy suggested is making word learning a priority. Teachers need to set time aside each day to work on word learning. Teachers must make vocabulary important on their list of instructional activities. "When entire schools focus on vocabulary, achievement increases – and not just literacy achievement, but achievement in the content area," (Fisher, 2007, p.186). This article supports the hypothesis of science vocabulary increasing student science knowledge because it identifies vocabulary and background knowledge as being pertinent in supporting students' understanding of science content.

METHODOLOGY

The treatment for this study was based on the focus question: What impact does the use of vocabulary have on student achievement in science? The sub-question was: Can more exposure to science vocabulary increase students' knowledge of science topics? The research methodology for this project received an exemption by Montana State University's Institutional Review Board and compliance for working with human subjects was maintained.

This action research project was conducted over a three month period, from November 2011 through February 2012. During those three months I chose two similar physical science units from the National Geographic Science Curriculum to teach. Each day consisted of a science lesson involving an introduction, vocabulary building,

experiment, and a conclusion to the lesson. Each lesson would typically last between 45 and 60 minutes.

To begin collecting data for my research, students took the Science Vocabulary Questionnaire (Appendix A). This questionnaire was given twice, pre-treatment and post-treatment. The questionnaire was used to assess how important students thought science vocabulary was in their learning of science topics and whether their opinions changed after the two units were taught. The responses from the Physical Science Questionnaire were tallied up and changed to percentages to see how the students' opinions changed throughout the course of this study.

The first unit, titled "How Can You Describe and Measure Matter?" began with the Physical Science Questionnaire. I administered the pre-assessment, a content test, to the class, reading aloud each question and giving wait time for each one (Appendix B). This assessment also contained a self-assessment that was collected and compared pre and post unit for similarities and differences. Throughout the first unit (prior to the beginning of the treatment), students were taught using a modified learning cycle format for each lesson. Each lesson was introduced with a question and students would predict what would happen during the experiment. Vocabulary was introduced, talked about briefly, and referenced in the textbook readings. Students wouldn't see or need to use the vocabulary again until the unit review, or chapter test. No additional vocabulary related activities were used. Each student kept a science journal where they predicted, inferred and wrote down their data. Pages were copied off for each student to glue into their journals and use as a data collection tool during experiments. After the unit was completed in four weeks, the post-test was administered, identical to the pre-test. These

data were collected and analyzed to compare for the similarities and differences with the pre-assessment.

The teaching of the second unit, titled “What Are States of Matter?” marked the beginning of the study’s treatment. Prior to teaching the unit, a pre-test was administered in the same way as the unit one pre-test, reading it aloud to the students and providing wait time for students to answer each question (Appendix C). This assessment also contained a student self-assessment that was gathered pre and post unit and compared for similarities and differences. Throughout the second unit, students were still taught using the modified learning cycle format, however, since this was the treatment unit, more emphasis was placed on vocabulary. Students still used their science journals to record their data as well as their vocabulary activities.

The first vocabulary activity used was a vocabulary foldable (Appendix D). Students were given five vocabulary words printed on white paper that would be used throughout the second unit. They were given a second sheet containing the definition of the words. They worked with a partner to find the correct definition to each word. They were allowed to use their science books for this task. When they were finished finding each definition, they cut them out and glued them on a foldable that had five sections of paper cut into a book. They glued the vocabulary word on the front and then the definition on the back. They could then use this as a reference throughout the unit whenever they needed to.

Another vocabulary activity was the vocabulary concentration game which was made using the target vocabulary for the unit (Appendix E). Students were allowed to play the game in their free time. They could do this individually, with a partner, or in a

group. They had to match the vocabulary word with the correct definition in order to obtain the pair. Also, each science lesson was started with a "science talk" where students were led in a conversation about the topics being taught by myself. Prompts were given to get the students to use the targeted vocabulary in the correct context. These talks were also used in group experiments, during which I circulated through the room and asked questions while they completed their science labs.

During three of the science lessons each student received a white board that they used as a tool to write down their answers to formative questions that I asked during science discussions. These questions and possible answers for each were written on the Smart Board. Students then chose their answer from the choices given, wrote them on their white boards, and held them up for an immediate response. Language frames were also used (Appendix F). One vocabulary assignment asked the students to fill in the correct answers on their paper. These questions were set up in a language frame format. The final vocabulary assignment was the unit review at the end of the chapter in their textbook (Appendix G).

At the end of the treatment unit two, the post-test was administered. Post-treatment, students also took the Physical Science Questionnaire again to see if their opinions of science vocabulary changed.

These data, along with other types that were collected, are summarized in the Triangulation Matrix, (Table 1). Data types were chosen to align with and provide information regarding my research questions.

Table 1
Data Triangulation Matrix

Focus Questions	Data Source 1	Data Source 2	Data Source 3
Primary Question: 1.What impact does the use of vocabulary have on student achievement in science?	Surveys, questionnaires, interviews, and teacher-made assessments	Teacher-made tests and performance tests	Formative assessments (probes, minute-papers, etc.), student projects, and science talks
Secondary Questions: 2. Can more exposure to science vocabulary increase students' knowledge of science topics?	Student-made artifacts	Student Journals	Student projects and Science Talks

DATA AND ANALYSIS

Results from the pre-treatment science questionnaire that was administered to my third grade students (*N*=18) revealed some common themes regarding students' perceptions about specific topics relevant to science vocabulary. These included the importance of science vocabulary, word parts, context clues, and dictionaries, as well as reading comprehension and building science vocabulary.

On the Physical Science Pre-Treatment Questionnaire, 59% of students responded that they felt science vocabulary is important to learn, while 6% *strongly disagreed* that science vocabulary is important. Almost half of the students *strongly agreed* that word parts are an important part of learning their science vocabulary, while 35% of them just agreed that word parts were important to learn along with their science content. Context clues were not the strongest category with only 29% *strongly agreeing* with their

importance and 47% just agreeing. Student responses on using dictionaries were spread across the board with 12% of students *strongly agreeing* and 12% *strongly disagreeing* with their importance and usage in learning science content. Forty one percent did *strongly agree* with the importance of their science vocabulary. Twenty nine percent of the third graders *somewhat agreed* that their reading comprehension would suffer if they did not understand the science vocabulary (Question #4). Almost all of the third grade students, 76%, who took the questionnaire *strongly agreed* that it was important to build their science vocabulary (Figure 1).

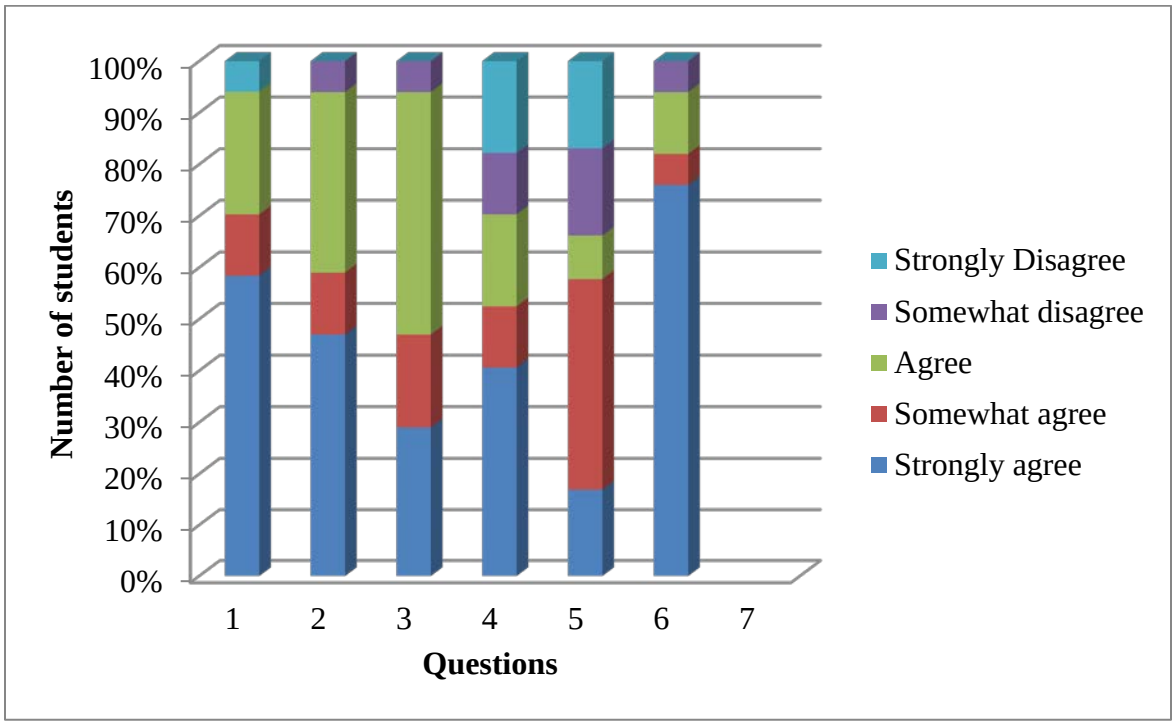

Figure 1. Students' responses to the Initial Science Vocabulary Questionnaire, (*N* = 18).

The results of the Unit One Pre-Self-Assessment showed 50% of students could measure and compare the mass of solids and liquids. Fifty percent of the students said they could also compare the mass of solids and liquids. Fifty five percent noted they could measure the volume of solids and liquids, however only 33% could compare the

volume of solids and liquids. Forty four percent could identify that matter takes up space before the unit began, but only 28% thought that matter has mass. The Unit One Post Self-Assessment showed 100% of the students knew that matter takes up space and matter also has mass. Seventy eight percent could identify properties of certain objects, and 61% knew what color an object takes on depending on the color that is surrounding it. Ninety four percent could measure and compare the mass of objects and 83% could measure and compare the volume of solids and liquids (Figure 2).

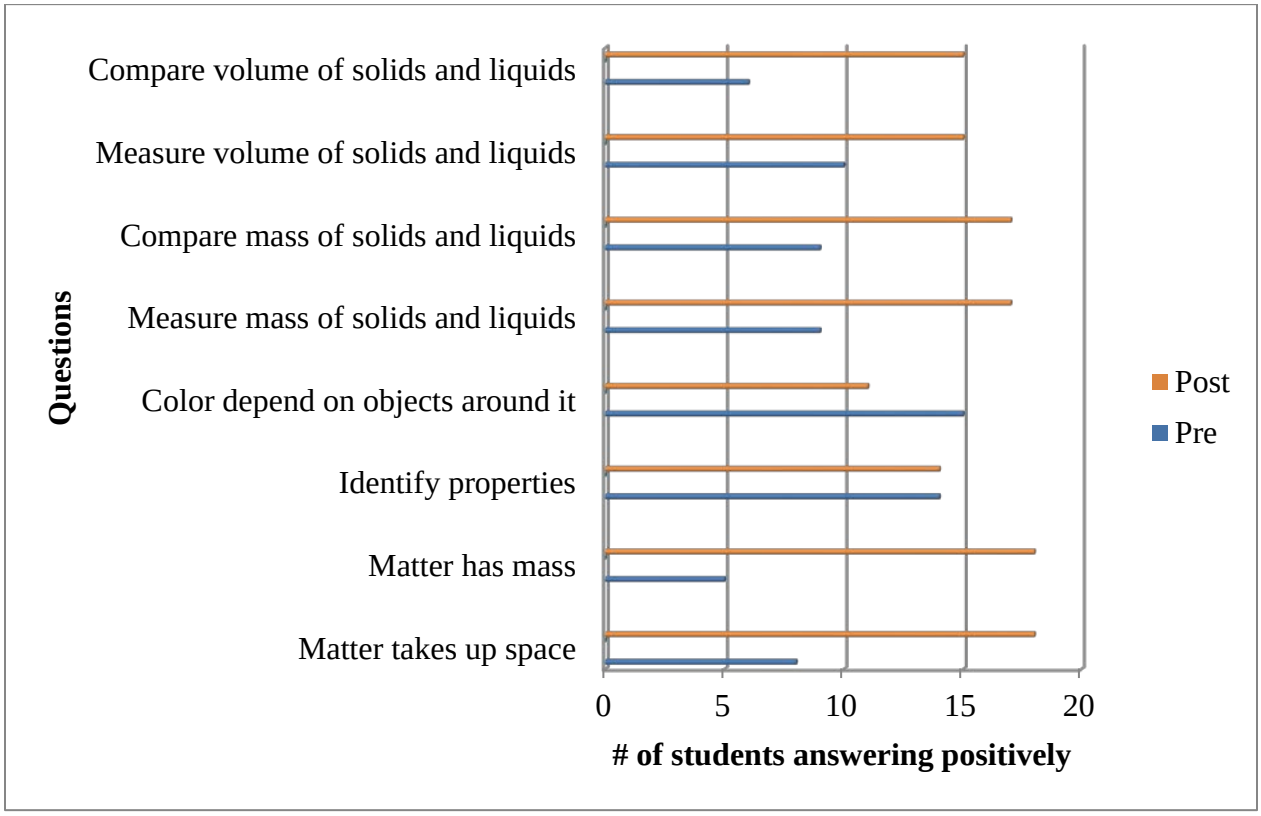

Figure 2. Students responding positively on the Unit 1 Pre vs. Post Self-Assessment, (*N* = 18).

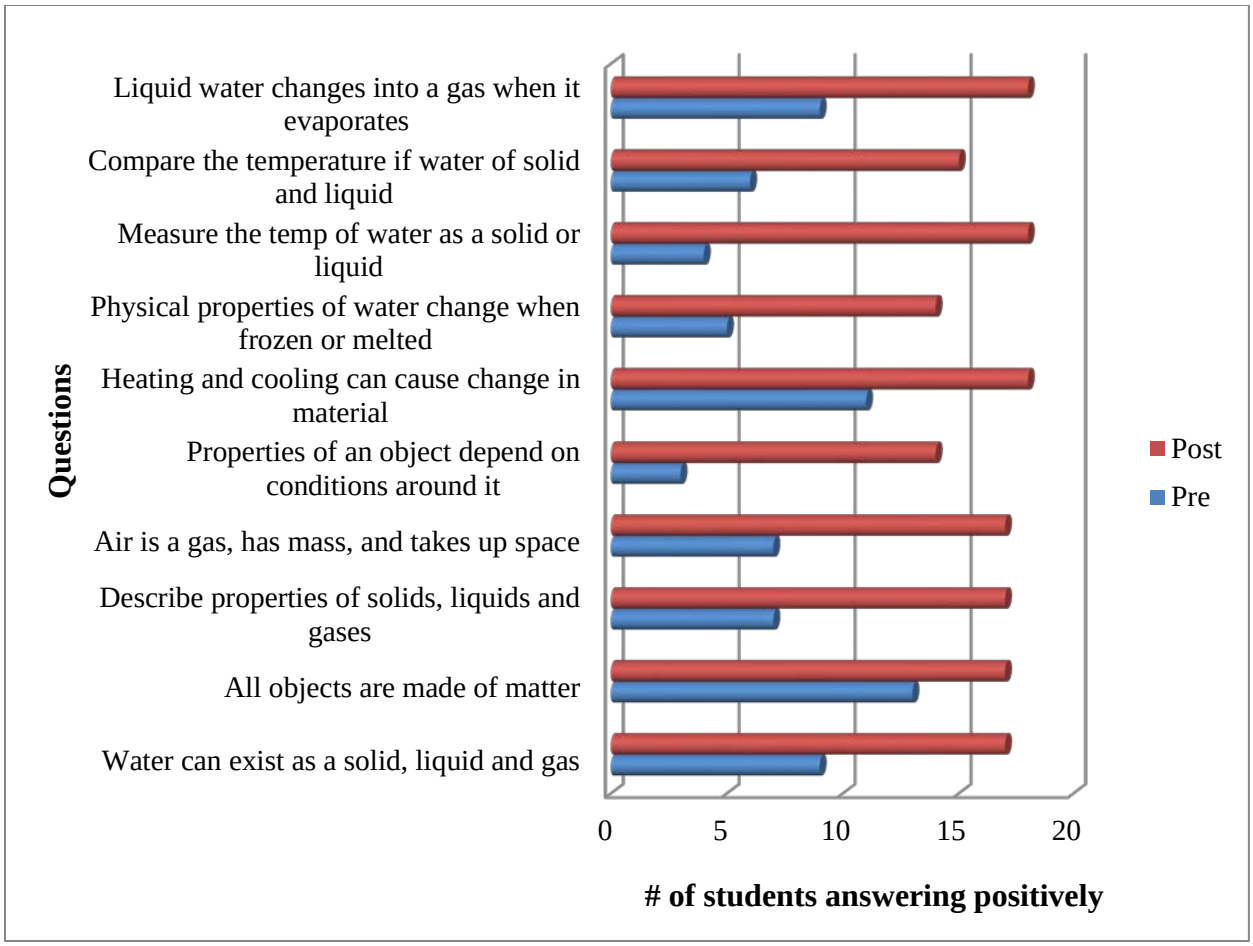

Figure 3. Students responding positively on the Unit 2 Pre vs. Post Self-Assessment, (*N* = 18).

Comparing unit one pre-test to the post-test overall average scores, students had an 18% increase in their science content knowledge from the beginning to the end. The biggest change in individual questions was with the question: *Which statement **best** describes matter?* On the pre-test only 44% chose the correct answer of: *All matter has mass and takes up space.* After the unit lessons and experiments, 100% of the students answered correctly. On the question, *"Charlie wants to compare the mass of two blocks. Which of these is the best way to compare them?"* only 44% of students got the correct answer of, *"Put one block on each side of a balance scale. The block that hangs lower has more mass."* After the post-test, the percentage of students who answered correctly

had not changed, it stayed at 44%. All of the other questions increased from pre to post test, but not dramatically, by an average of about 18%.

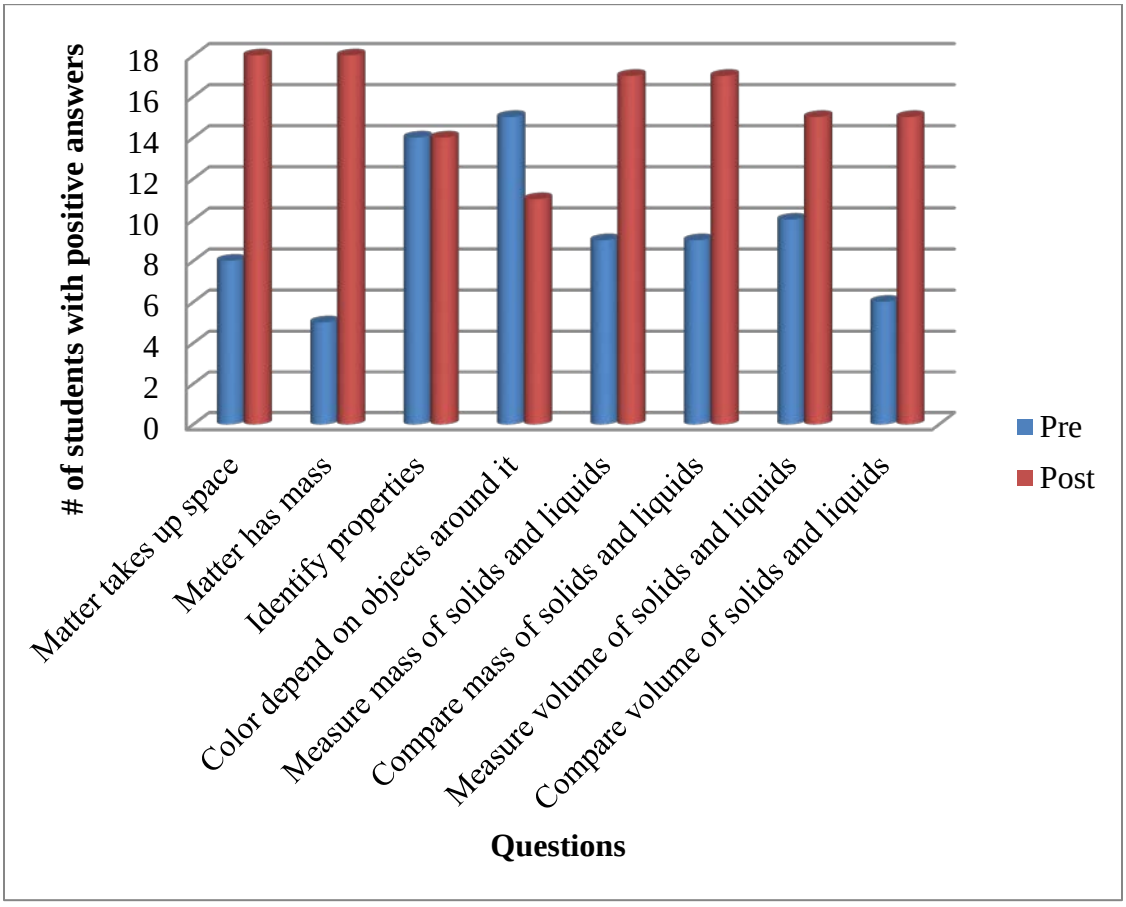

Figure 4. Third grade students Unit 1 Pre vs. Post Unit Assessment Scores, (*N* = 18).

In the second unit, students showed an average increase in their vocabulary knowledge from pre to post test on the Chapter 2 Physical Science Assessment. Question one on the pre and post-test had no change, with, 94 % of the students answering correctly on both tests. Question two: "*Water can be found in three different states of matter. What are they?"* only 22% answered correctly on the pre test with, *"solid, liquid and gas"* the other most popular answer was, *"ice, snow and rain."* The post-test increased by 61% with 83% of the students choosing the correct answer. The answers that didn't increase drastically from pre to post treatment had questions asking about

temperature. Question five asked, "*Lisa found drops of water condensing on leaves in her garden early in the morning. What causes condensation to form?*" Of the tested group, 27% chose the correct answer of, "*A decrease in air temperature.*" The average score on this question increased from pre to post treatment by 22%.

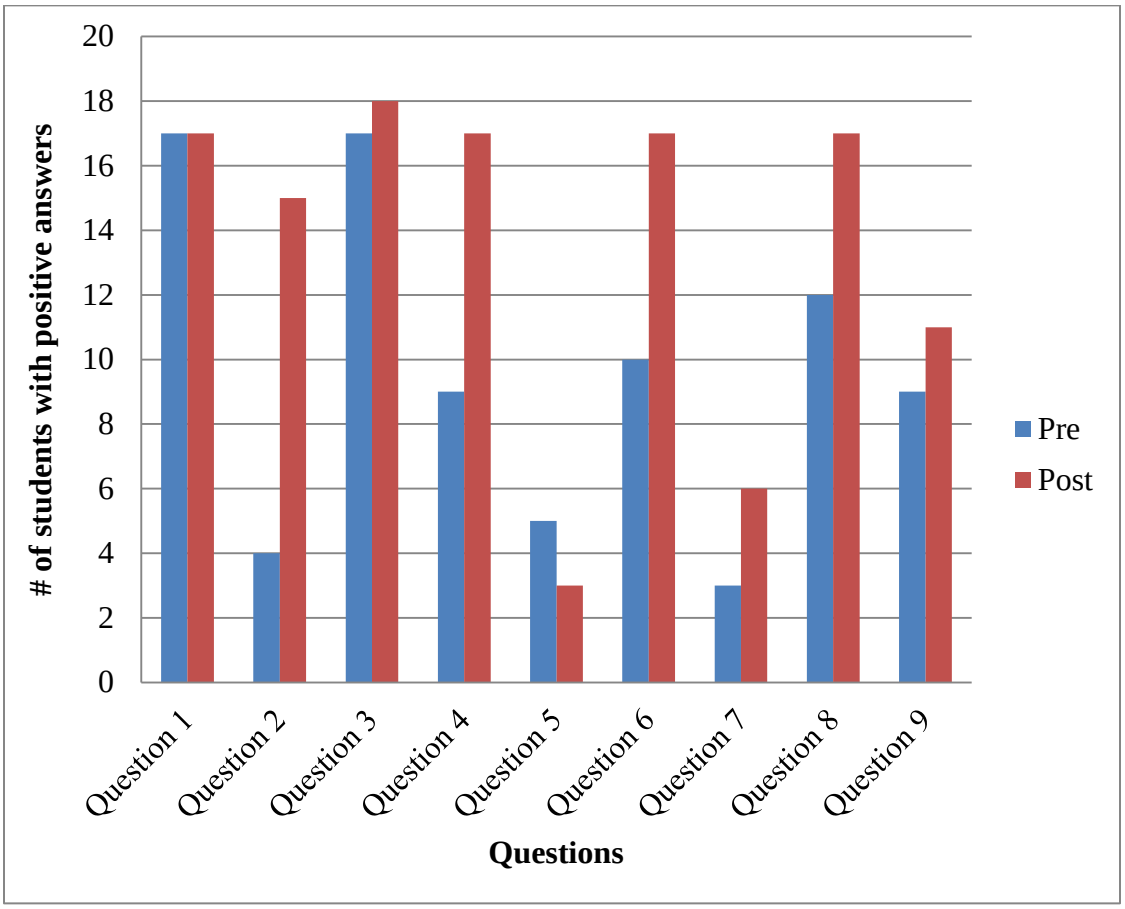

Figure 5. Students' average scores on the Unit 2 Pre vs. Post Unit Assessment Scores, (*N* = 18).

INTERPRETATION AND CONCLUSION

At the conclusion of the action research project, I saw that the students slightly gained more science knowledge because of their vocabulary knowledge. By exposing them to vocabulary constantly during the treatment period, they gained more science

content knowledge. Using different vocabulary strategies allowed students to discover a way to help them remember and understand the vocabulary needed for the science topic being taught. The students were able to use their vocabulary words in science talks and in their journals, showing me they knew what the word meant when they were using it in context.

Students brought some background knowledge with them from Unit 1 to Unit 2, so some on their pre-test questions and post-test questions didn't show a dramatic increase, however most of the Unit 2 pre to post test scores increased. On question 5, which was, *Lisa found drops of water condensing on leaves in her garden early in the morning. What causes condensation to form?* Answers included: *a) A decrease in air temperature, b) An increase in air temperature, c) A decrease in the amount of water vapor in the air, or d) An increase in the amount of water vapor in the air.* Only three students chose the correct answer of *a decrease in air temperature*. But, twelve students chose a decrease in the amount of water vapor in the air. I truly believe they were confused and the answer choices confused them.

During Unit 1 of my action research project, I noticed students were not as confident in science. As in their Unit 1 self-assessments they increased in their confidence in the topic of study in all but one concept. However, there wasn't a lot of science talk, or the use of their vocabulary words in their science journals. Also, there was more of a dramatic increase in their confidence of the content in Unit 2. I believe the more they worked with the science words, the more confident they got, and the more science knowledge they gained.

My primary question of, *What impact does the use of vocabulary have on student achievement in science?,* was answered by using the Unit 1 and Unit 2 pre/post content assessments. There was more achievement in Unit 2 after focusing on more vocabulary than in Unit 1. My secondary question of, *Can more exposure to science vocabulary increase students' knowledge of science topics?,* was answered by using different vocabulary activities such as: white boards, response cards, matching games, foldables, science talks, language frames, science vocabulary sentences, and science journals. With observations of these activities I noticed from day to day the students got more confident in the use of words. They got better at vocalizing the words by using them in their science talks as well as writing with their vocabulary words in sentences and in their science journals.

VALUES

Although I have taught third grade science for eight years, my knowledge and expertise offered me little in the way of getting my students to understand science vocabulary. Keeping them engaged in science was easy when I pulled out the materials for a science experiment. But, getting them to understand the why and how was an important part of my science teaching I didn't take into consideration. However, after my action research project, my way of teaching changed. I wanted to know how to make science make sense to my students. I wanted them to understand why science works the way it does. I wanted my students to be able to tell me the why and how. This action research provided me with the opportunity to implement what I learned in this process into the way I taught my students.

The most difficult task during this action research project was how to choose the correct tools to use. I had to give this a lot of thought, and I had to research a lot of different activities for vocabulary achievement. Then deciding how to collect the data was also a challenge. Not only was collecting the data challenging, but deciding how to show the increases or decreases with the correct graphs proved to be difficult as well. This also gave me the chance to reflect back on my own teaching habits, and allowed me to notice them, change them, and make my teaching practices better. In turn, this action research project contributed to the increase in my awareness of the topic and provided me with skills and strategies to implement in my classroom to increase not only my students' knowledge, but also to improve my teaching abilities.

As a learning student myself in this process, I found that by rushing through content just to get to all my standards and benchmarks does not mean students are learning. It simply means they are part of the cycle and jumping through the hoops. By taking the time to introduce vocabulary, work with the words, applying them to experiments, as well as talking with them in our science conversations and everyday talk, students gained vocabulary knowledge that they will use for years to come, rather than referring to them once or twice.

By doing my own action research, I gained perspective into my own teaching and students' learning. I feel this experience was a positive one, and I learned a tremendous amount about teaching, and learning. I gained confidence in my abilities to perform challenging tasks along with everything else I put onto my plate. I took on a huge task that I was not confident in completing, and I did it. And with that, I have grown into a

more confident teacher as well as person. I will admit that action research is still a challenging task, but well worth the outcome of what is going on in the classroom.

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APPENDICES

APPENDIX A

SCIENCE VOCABULARY QUESTIONNAIRE

Science Vocabulary Questionnaire

Code_____

1) Science vocabulary is important to learn.

   Strongly agree somewhat agree agree somewhat agree strongly disagree

2) Word parts are an important part of science vocabulary.

   Strongly agree somewhat agree agree somewhat agree strongly disagree

3) Context clues are an important part of science vocabulary.

   Strongly agree somewhat agree agree somewhat agree strongly disagree

4) Dictionaries help with science vocabulary.

   Strongly agree somewhat agree agree somewhat agree strongly disagree

5) If I don't understand the science vocabulary, my reading comprehension suffers.

   Strongly agree somewhat agree agree somewhat agree strongly disagree

6) It is important to build your science vocabulary.

   Strongly agree somewhat agree agree somewhat agree strongly disagree

APPENDIX B

CHAPTER ONE PHYSICAL SCIENCE PRE/POST ASSESSMENT

Chapter 1 Physical Science Pre/Post-Test

1) Miguel had a jar of objects. He described these objects to his friends. Miguel said the objects were smooth and round. Which properties did he use to describe the objects?
    a. Color and size
    b. Color and shape
    c. Texture and size
    d. Texture and shape

2) Which statement **best** describes where you can find matter?
    a. Only nonliving things are made of matter
    b. Everything in the world is made of matter
    c. Anything you cannot see is made of matter
    d. Only things you can touch are made of matter

3) Amy places a thin sheet of blue plastic over a flashlight. Then she shines the flashlight on white paper. What color will she see on the paper?
    a. Blue
    b. White
    c. Green
    d. Yellow

4) Which statement **best** describes matter?
    a. Most matter has mass
    b. Some matter takes up space
    c. All matter has mass and takes up space
    d. Only matter that can be seen takes up space

5) What could you do to see the difference in texture between two objects?
    a. Place the objects in water
    b. Look at the objects from far away
    c. View the objects with a colored flashlight
    d. Use a magnifying glass to get a closer look

6) Charlie wants to compare the mass of two blocks. Which of these is the **best** way to compare them?
    a. Observe both blocks. The larger block has more mass.
    b. Put one block on each side of a balance scale. The block that hangs lower has more mass.
    c. Put one block on each side of a balance scale. Add more blocks until both sides are even. The side with more blocks has more mass.
    d. Find the mass of a container. Put both blocks in the container and put it on the scale. Subtract the mass of the container to find the mass of the blocks.

APPENDIX C

CHAPTER TWO PHYSICAL SCIENCE PRE/POST ASSESSMENT

Chapter 2 Physical Science Pre/Post Test

1) Nick placed a glass of juice in the freezer and left it there overnight. What will happen to the juice?
    a. The juice will melt.
    b. The juice will condense.
    c. The juice will turn from a solid to a gas.
    d. The juice will turn from a liquid to a solid.

2) Water can be found in three different states of matter. What are they?
    a. Ice, snow and rains
    b. Solid, liquid and gas.
    c. River, stream, and lake.
    d. Mass, space and form.

3) How can you tell that a pencil is made up of matter?
    a. It is bright yellow.
    b. It lets you write stories.
    c. It is used in the classroom.
    d. It has mass and takes up space.

4) Why is an ice cube a solid?
    a. It keeps its shape.
    b. It fits in a glass.
    c. It feels cold.
    d. It is thick.

5) Lisa found drops of water condensing on leaves in her garden early in the morning. What causes condensation to form?
    a. A decrease in air temperature.
    b. An increase in air temperature.
    c. A decrease in the amount of water vapor in the air.
    d. An increase in the amount of water vapor in the air.

6) The picture shows a glass with ice and the glass after the ice has melted. What change happens when the ice melts?
    a. It begins to cool.
    b. It becomes a gas.
    c. It evaporates away.
    d. It takes the shape of the glass.

7) Eddie placed a pail of solid water outside. He measured the water's temperature every hour. His results are shown in the table. At what time did Eddie find the water in a liquid state?
    a. 8AM
    b. 9AM
    c. 10AM
    d. 11AM

8) Adam sets a dish of water on a heater. The next day, Adam notices that the water evaporated. How has the water changed?
    a. From a gas to a liquid
    b. From a liquid to a gas
    c. From a liquid to a solid
    d. From a solid to a liquid

9) Which is true about air?
    a. It has mass and takes up space.
    b. It cannot be kept in a container.
    c. It is the space between matter.
    d. It is not a solid, liquid or gas.

10) Julia fills a shoebox with pencils. She wants to fill the same shoebox with blocks. What does Julia have to do before she can put the blocks in the box? Why does she have to do that?

APPENDIX D

CHAPTER TWO PHYSICAL SCIENCE VOCABULARY FOLDABLE TEMPLATE

matter	liquid
mass	gas
volume	evaporation
texture	condensation
solid	states of matter

APPENDIX E

CHAPTER TWO PHYSICAL SCIENCE MATCHING

matter	liquid
mass	gas
volume	evaporation
texture	condensation
solid	states of matter

water vapor turns to drops of water	liquid water turns to water vapor
spreads out to fill a space	takes shape of its container
always keeps its shape	a solid, liquid or gas
the surface of any area made up of matter	the amount of space matter takes up
the amount of matter in an object	anything that has mass and takes up space

APPENDIX F

CHAPTER TWO PHYSICAL SCIENCE LANGUAGE FRAME

Chapter 2 Physical Science
Vocabulary Language Frames

Name_____

1) A solid keeps its
_____.

2) _____ is a solid.

3) _____ is not a solid.

4) When a solid is put in a container, it will

5) _____ is a solid because

Use page 49 in your Physical Science book to complete the following.

6) The water in this pot
is_____.

7) Eventually, all of the water in the pot will
_____.

8) Water will boil when its temperature

9) When water boils

10) If something takes up space it has _____.

11) The three states of matter are

12) Placing a glass of water in the freezer would

13) Condensation appears when

14) Air has _____ and takes up _____.

15) When water evaporates it changes from a _____ to a _____.

16) In order to put dirt into a box that is full of rocks, what must you do? Be specific!!!! Draw a picture when you are done explaining.