

THE EFFECTS ON INDIVIDUAL GRADES AND TEST SCORES WHEN  
ASSIGNING AND GRADING HOMEWORK IN A NINTH GRADE PHYSICAL  
SCIENCE CLASSROOM

by

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**ABSTRACT**

The purpose of this study was to examine the effects of graded versus non-graded homework on student proficiency, test scores and overall course grades in a ninth grade physical science course. This question arose because of the increasing number of students failing the class, as a result of zero's being recorded for missing homework, even though they were proficient and passing the chapter tests. Two classes were selected and compared on proficiency, chapter test scores and overall grades after each unit. Student interviews, surveys, and questionnaires were also used to identify the impact of homework in science. It was determined that ninth grade students in physical science do not need to have graded homework assignments in order to display proficiency on tests and pass the class with an above average grade.

## INTRODUCTION AND BACKGROUND

After three years of teaching at Waterloo East High School, located in Waterloo, IA, students' homework has become a prominent issue. The question of how much homework to assign based on the teachers expected quality of student work is a major decision all teachers must make. I have adjusted my teaching practice from grading all student homework and including it in the students' overall grades, to having students work on un-graded assignments in class.

Waterloo has a population of 68,653 and is located in northeast Iowa where the city is split by the Iowa River (<https://www.google.com/webhp#q=waterloo+ia>). There are four high schools located in the city; Waterloo East and Waterloo West are the public schools divided by the river, Expo is the public alternative school for all students who decide to leave East or West, and Columbus Catholic is the parochial high school. East High School also educates students from the adjoining smaller towns of Evansdale and Raymond.

East High School educates approximately thirteen hundred students in grades 9-12. Fifty-three percent of students are of Caucasian descent which includes a small population of Bosnian immigrants who fled to Waterloo in the late 1990's. Another 39% of students at East High are African-American, along with 7% Hispanic and 1% Asian/Pacific Islanders. Sixty-seven percent of these students qualify for free or reduced lunch prices (2013-2014 East Waterloo School Improvement Plan).

The east side of Waterloo is where the majority of poverty stricken African-American children live. With Evansdale and Raymond students being raised in lower income white families, East High School is very ethnically diverse. The research for this

project was done using two separate sections of ninth grade physical science. There were a total of 51 students, with 32 females and 19 males. Each class section had anywhere from 20 to 31 students.

After a year of grading student work and finding that some students were still passing the class even after they performed poorly on the chapter tests, I began to question the practice of homework. The following year, I did not grade homework, but rather assigned work for students to complete during class time and then reviewed the following day. Students knew ahead of time their homework was not going to be graded and that there would be short quizzes allowing the students to demonstrate their knowledge from the practice problems. After observing that many students still performed well on chapter tests, the practice of assigning homework was under debate.

The ninth grade core team of teachers often discussed the issue of grading homework. Some teachers graded all homework and entered it into the grade book. Others assigned daily work for no points and then assigned homework to be graded every so often. Another teacher also assigned daily work worth no points, but incorporated the time they used working into a participation grade. For those teachers still assigning homework, getting students to take the assignment home, finish the work, and return it the following day became a struggle. Many of the students at East High School are required to work part time jobs after school in order to help support their families. Others participate in several extracurricular activities which take up a majority of their time after school. These issues become difficult for the time constrained students.

When students were interviewed and asked how they felt about homework and finishing problems for a grade, one student said, "I don't have the time to complete the



work when I get home.” Another said, “When I try to work the problems at home on my own, I get stuck and don’t know how to finish.” Some felt homework was a waste of their time when they already understood the topic during the lesson. One student asked, “Why do I need to work problem after problem that I already know how to do?” There were also students who felt homework was essential in learning responsibility and they liked the idea of homework because it was an easy score in the grade book for them. Some students even admitted to cheating and copying answers from other students in order to obtain full points in the grade book.

Homework can help students prepare for tests and it requires them to practice problems on their own. However, several students take advantage of the fact homework counts towards their overall points, and they begin to care more about the points rather than actually learning the material. Through the controversy of when to grade homework, how often to assign it, and whether it is truly necessary for comprehension of material, this focus question was developed: *What are the effects on individual grades and test scores when assigning and grading homework in a ninth grade physical science classroom.* In addition, the following sub-questions were researched.

- Does assigning homework raise test scores?
- Does assigning homework raise overall grades?

### CONCEPTUAL FRAMEWORK

Homework’s true effect on academic achievement has been a controversial topic throughout the years. The instructional purpose of homework is to provide the student with an opportunity to practice or review material that has already been presented in class. Homework can require students to integrate separately learned skills and concepts

and establish communication between the parent and child (Cooper, Robinson, & Patall, 2006). As homework serves a different purpose at different grade levels, it should be relevant and purposeful, with students being provided timely and specific feedback regarding their work (The Association of California School Administrators, 2007). The impact homework might have on achievement will vary from student to student depending on how much each student is assigned or completes (Cooper, Robinson, & Patall, 2006).

The controversy between homework and its effects started years ago with the positive and negative side effects on children. A number of synthesis studies have been conducted on homework, spanning a broad range of methodologies and levels of specificity (Marzano, 2007). As far back as the 19<sup>th</sup> century, students in high school were the only ones burdened with homework; the common expectation was two to three hours per night. Elementary and middle school students were only assigned small assignments which never took them much time to complete. With just a fraction of the population choosing to attend high school, educators reasoned that those who wished to attend must be willing to study, and those who are unwilling were free to drop out (Gill & Schlossman, 2004).

Children played a critical role as workers in the household, so it is not surprising many families could not afford to have their children continue schooling. With the requisite two to three hours of homework per night, it became too much for a family to manage while keeping the house (Kralovec & Buell, 2001). It was not until the end of the 19<sup>th</sup> century that the first systematic critique of homework arose as a result of a research project conducted by Dr. Joseph Mayer Rice. He concluded a child's often

arduous devotion to practicing spelling at home was unrelated to their later spelling ability (Gill & Schlossman, 2004). Educators began to look at homework in a negative way for the first time because of his research.

From the 1890s to the 1940s, the Progressives' crusade against homework began. The drill/memorization/recitation routine was now attacked as a threat to pre-teens' physical and mental health. Local and state women's organizations pressed school boards to regulate and minimize how much homework teachers could assign (Gill & Schlossman, 2004). Perhaps the height of this movement came in 1901 when California state legislature passed a law abolishing homework for children under the age of fifteen and limited it in public high schools (Eren & Henderson, 2011). In 1930, the American Child Health Association believed homework threatened children's health by depriving them of outdoor play that was essential to healthy development. Critics also argued that learning involved more than just school work, and homework deprived children of important non-school learning activities (Gill & Schlossman, 2004). Besides the physical and mental health of the children, more concerns were being raised about homework interfering with home life (ACSA, 2007). With such dramatic changes in both demographics and economics, family life began to change, as well. Parents wanted to teach their children how to become good citizens and to share in the responsibility of running a home (Kralovec & Buell, 2001). If more homework was assigned, the parents' agenda was being put on hold.

By the 1940s, developing problem-solving abilities, as opposed to learning through drill, became a central task of education (Cooper, Robinson, & Patall, 2006). The homework behaviors of high school students were fully consistent with the

Progressives' antipathy toward homework. In 1948, a study determined that only eight percent of high school students admitted to doing more than two hours of homework each day (Gill & Schlossman, 2004).

Soon after, the anti-homework idea swung the opposite direction again. The mid to late 1950s witnessed an increase in the rigor of U.S. education as part of the United States/Soviet space race (ACSA, 2007). After the Soviet Union launched the Sputnik 1 satellite in 1957, the trend toward less homework was quickly reversed. The United States became obsessed with competing with the Russians. The homework problem was reconceived as part of a national crisis; the U.S. was losing the Cold War because Russian children were smarter (Vatterott, 2009). America became concerned that a lack of rigor in the educational system was leaving children unprepared to face a complex technological future and to compete against our ideological adversaries (Cooper, Robinson, & Patall, 2006). The view on homework became an instrument of national defense policy. As homework was rehabilitated, it was also re-invented to increase student and parent investment toward academic excellence. At this point, teachers were encouraged to vary the ways they taught. Teachers could raise the academic content of homework and make it more enjoyable for students by incorporating activity-based, hands-on, individualized assignments. With more of a selection in what to teach, homework became an important connection for parent to school communication. From the 1950s to the 1960s, data shows students did indeed begin doing more homework, and the proportion of high school students doing two hours or more daily nearly tripled (Gill & Schlossman, 2004).

The academic excellence movement fell apart very suddenly between 1968 and 1972 (Gill & Schlossman, 2004). By the late-1960s, homework came to be seen as a symptom of excessive pressure on students, and the approach to homework became more relaxed (Cooper, Robinson, & Patall, 2006). Parents were arguing that children should be free to play and relax in the evenings, and again the amount of homework decreased (Bennett & Kalish, 2006). Other than homework, the big concern of schooling began to shift to whether students could be persuaded to attend school regularly, pay attention to their teachers, and study seriously (Gill & Schlossman, 2004).

By the 1980s, with concern about the rigor of U.S. education, homework was once again on the rise (ACSA, 2007). Gill & Schlossman (2004) believed the excellence movement of the 1980s was motivated by threats from economic competitors around the world. Throughout the 1980s and 1990s, homework's value was touted both for academic and character building purposes. The pro-homework trend continued into the 1990s, as the push for higher standards resulted in the conclusion that more homework was a remedy (Vatterott, 2009). A report in 1994 looked at the amount of time students in the United States spent studying core academic subjects compared to other countries that typically outperform the United States on academic achievement assessments. The study found students abroad are required to work on demanding subject matter at least twice as long as are U.S. students (Marzano, 2007).

Throughout the 20<sup>th</sup> and into the 21<sup>st</sup> century, many educators and parents believed that homework created disciplined minds. A national survey by Public Agenda in 2000 stated 64% of parents believed their child was getting about the right amount of homework, while 25% thought there was too little homework, and only 10% believed

there was too much homework assigned (ACSA, 2007). Then, in 2002 President George W. Bush signed into laws the *No Child Left Behind Act of 2001*. This asked America's schools to describe their success in terms of what each student accomplished (Cooper & Gersten, 2003). Because of this act, several schools started pushing for homework to ensure student and school success.

Assigning homework throughout students' years in school can develop not only academic achievement, but developing homework habits early means students will be more disciplined about completing homework in high school and beyond (Kralovec & Buell, 2001). Homework is expected to encourage students to learn during their leisure time, improve students' attitudes toward school, and improve students' study habits. Because homework generally requires students to complete tasks with less supervision and under less severe time constraints than is the case in school, home study is said to promote greater self-direction and self-discipline (Cooper, Robinson, & Patall, 2006). Homework's main focus is to help students learn more by increasing retention and understanding of the material covered in class. Some positive effects of homework include: the retention of factual knowledge, comprehension of concepts, improved study habits, strengthened critical thinking and problem-solving skills, organizational and time management skills, self-discipline development, and the appreciation for learning beyond the school walls (ACSA, 2007). The skills acquired by completing homework can be used in both academics and non-academic activities. Teachers can use homework in an attempt to increase parents' appreciation of and involvement in schooling. Parents can demonstrate their interest in the academic progress of their children by assisting, supervising, or checking the completion of those homework assignments (Cooper,

Robinson, & Patall, 2006). In a study done by Cooper, Robinson, & Patall (2006) there was strong evidence homework and achievement were a positive correlation for secondary school students. Through these studies, researchers also revealed a positive effect of homework on unit tests. In math classes' grades seven to eleven, studies done by Eren & Henderson (2001) showed an extra half-hour of math homework advanced a student nearly two grade equivalents. While math homework was shown to have a large, positive effect on test scores, homework in science, English, and history are shown to have little to no impact on test scores. However, Marzano (2007) believes if a district or school discards homework all together, it will be throwing away a powerful learning tool.

Although there are many positives, the homework controversy also has a negative side. With close to 20% of children in the United States living in poverty, doing homework further exacerbates their academic challenges. Even though the majority of parents prefer their child being assigned homework, Kralovec and Buell (2001) believe homework often disrupts family life, interferes with what parents want to teach their children, and punishes students in poverty for being poor. Understanding students' mistakes is a crucial part of the teaching process. When work goes home, teachers have little understanding of the mistakes the students have made on the material and little control over who does the work. Kralovec & Buell ask the question: When we leave a sizable portion of learning to parents, how can we hold schools and teachers responsible for meeting higher standards? They question how teachers know the level of their students' learning if they do not know how students are getting their assignments done at home. Parents pressure students to complete homework assignments or do them with unrealistic rigor. Also, parents may create confusion if they are unfamiliar with the

material sent home for study or if their approach to teaching differs from that used in school (Kralovec & Buell, 2001).

Many students' daily schedules are so overbooked that homework is often done in haste and is of poor quality. Parents have expressed concern with the amount of time homework requires. They argue that children are experiencing difficulty balancing after-school schedules, and much of the assigned homework is redundant and meaningless and burden the students and the entire family. Being a burden on students' lives and families can lead to a negative influence on attitudes toward school. If a student has already mastered the concept, the additional practice does little to increase achievement. Also if the student does not understand the concept, the repeated incorrect practice leads to frustration (ASCA, 2007). Many students consider homework the chief source of stress in their lives and can lead to general physical and emotional fatigue (Cooper, Robinson, & Patall, 2006). Concerns about homework are also part of a growing apprehension in the United States about the time pressures both adults and children now face. In the 1990s, Kralovec and Buell (2001) did a study through Maine's Department of Education and interviewed more than 45 at-risk students to help identify why they dropped out of high school. Through these interviews they discovered the student's inability to complete homework was a major factor in his or her decision to drop out of school. With such pressure on students and parents to complete all requirements for not only one class but several throughout the day, it raises the possibility that homework might promote cheating or excessive reliance on others for help with assignments (Cooper, Robinson, & Patall, 2006).



Overall, the cyclical nature of the homework debate has been emerging for hundreds of years. No search of the literature is likely to succeed in retrieving all studies relating homework to achievement (Cooper, Robinson, & Patall, 2006). Furthermore, it may be premature to conclude that additional homework will improve educational outcomes (Eren & Henderson, 2011). When homework assignments are of a reasonable length, and when meaningful feedback is provided in a timely manner, homework can be an effective strategy for improving student learning (ACSA, 2007). While there is evidence that the effect of subject matter on the homework-achievement relationship is small, it should be viewed as suggestive rather than conclusive (Cooper, Robinson, & Patall, 2006). As a country, the United States is so diverse economically, culturally, and in parenting styles, it is not surprising that not all would agree on a practice that bridges both school and family life (Vatterott, 2009). Either way, one thing is evident, further research should always be done with such vast changes yet to come in our country.

## METHODOLOGY

The purpose of this study was to determine the effects on individual grades and test scores when assigning and grading homework in a ninth grade physical science classroom. 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 (Appendix A).

The research was conducted on two class sections of physical science. Both classes contained 20 to 31 students with several having an Individual Education Plan (IEP). These class numbers changed throughout the research due to students moving, switching classes, or deciding to not come to school. In the first class section, problems

were administered in class and the students were given a short amount of time to work the problems and ask questions if needed. If students did not finish the problems during this time, they were required to take the work home and finish the problems on their own as homework. The students then turned the assignment in the following day and were graded for a score in the grade book. The next day, the graded assignment was returned back to the students allowing them to determine possible mistakes they may have made. This group was referred to as the treatment group.

The other class section was assigned the same problems. However, if the students did not finish during the class time given, they were not required to take it home and finish. Rather, we discussed and went over the problems together as a class the following day. This group was referred to as the non-treatment group. This routine occurred for roughly seven weeks, through two unit chapters, and then the two group's switched roles.

To begin the first semester, each student in Ms. Jenkins' freshmen physical science took the Pre-School Year Homework Survey (Appendix B). This provided a basic understanding of how students felt about graded homework and what homework habits they used while in middle school. A scale from 1-3 was used on the survey. Scoring an average of one meant those students were assigned a lot of homework, but they always did their work without having issues. When students scored an average of two, this meant they used the time at school to work, on occasion struggled through the problems, but most of these students always tried to finish their work. Scoring around a three indicated that the student did not enjoy doing homework, occasionally did it, and possibly struggled when they attempted the assignment. Students circled which choice most represented them before entering high school. Each survey score was added up and

translated based on their total points. The overall percentages were also calculated based on the number of students who chose 1, 2, or 3 in each question.

Half-way through the first treatment group, after one unit test, the Midway Interview was administered to randomly selected students who were currently scoring in the A, C, and F ranges at the time (Appendix C). This provided input from high, average, and low scoring students. Each range of students answered three questions pertaining to why they were earning their current course grade along with a fourth question asking if there was anything else they would like to add. If the students' homework was currently graded, they were then asked if they believed their course grade would improve, decline, or stay the same if the in-class assignment was not graded. For those students' homework which was not graded, they were asked if they believed their course grade would improve, decline, or stay the same if their homework was graded. The interview questions were analyzed on how many of the A students believed having their homework graded was keeping them in the A range. This was compared to those who believed the homework did not matter; they simply understood the material and did well on their tests and quizzes. A percentage was calculated for each interview based on the number of responses that led in the direction of needing their homework graded in order to succeed. This analysis was done for each group of students at the A, C, and F ranges.

At the end of the first two chapters, before the groups switched roles, a survey was administered to the two classes. Two separate surveys were given depending on if the student's homework had been graded for the first seven weeks or not. The first survey, End Group One Survey-Graded, provided insight on how the students felt the homework being graded helped them prepare for tests, affected their overall grade, and

how they completed the homework that was not finished during class time (Appendix D). The second survey, End Group One Survey-Not Graded, represented the opposite and allowed insight on how students felt about not having their homework graded affected their test scores and overall grade, and asked if they still did their work, even though it was not graded, in order to understand the material (Appendix E). For both surveys a scale of 1-3 was used while calculating the percentage of students who chose each answer. If the highest percentage was choosing a one on average, this indicated that the majority of students always did their work and were able to do the problems on their own. If the highest percentage was a two, this indicated most students occasionally did their work because they would either struggle through the problems or would already know how to do the work so they would not finish. If the highest percentage was a three, this indicated most students did not do their homework because of a lack of understanding the material, or they knew it was not graded so they would not complete it for easy points in the grade book.

At the end of both treatments groups, once all of the students had the chance to have their homework graded, the End of Homework Research Survey/Questionnaire was given (Appendix F). This survey provided a clear understanding on when the students felt they best understood the material, felt the most prepared for tests, and the effects on their overall grade. The first three questions asked the students to simply circle *when homework was graded* or *when homework was not graded* based on the scenarios given. There were then three questions based over the time when homework was not graded. These questions were based on whether they still felt prepared for tests, used the class time given to work, and if they knew they still had to do the work in order to prepare

themselves for tests and quizzes. From these questions, the students circled *Yes*, *Sometimes*, or *No* based on their opinions. A final question asked students to write which method they preferred and explain why they chose that particular method.

At the beginning of each chapter, a ten question multiple-choice pretest was taken by each student, for example *Chapter 3 States of Matter Pretest* (Appendix G). At the end of each chapter, when the students took the unit test, these same ten pretest questions were the last ten questions of their test. The final scores on these ten questions were documented into the same spreadsheet and compared group to group depending on if their assignment was graded or not. If the student got eight to ten of the questions correct, they were considered *Proficient*. Scoring a six made them *Close to Proficient*, while only earning five or below yielded *Not Proficient*. For each chapter, the student's overall grades were also recorded. This allowed for comparison from group to group on each chapter as well as providing comparison on individual student scores from treatment to non-treatment groups.

Evidence to answer the primary research question was provided by three data sources in response to the two secondary questions (Table 1).

Table 1  
*Data Triangulation Matrix*

Research Questions	Data Source 1	Data Source 2	Data Source 3
<i>Primary Question:</i> What are the effects on individual grades and test scores when assigning and grading homework in a ninth grade physical science classroom?	Surveys, Questionnaires, and Student Interviews	Student Pretests and Chapter Formative Quiz Scores	End of chapter tests
<i>Secondary Question:</i> Does assigning homework raise test scores?	Pretest scores compared to the same questions on chapter tests	Individual student test scores from chapter to chapter	Overall class test scores for each chapter
<i>Secondary Question:</i> Does assigning homework raise overall grades?	Individual student grades from chapter to chapter	Number of students from each group with A's, B's, C's, D's, F's	

## DATA AND ANALYSIS

The results of the Pre-School Year Homework Survey indicated while in middle school, 66% of the students said some of their teachers would assign homework, require them to complete it at home, and bring it back the following day to be graded and entered into the grade book ( $N = 68$ ). Only two percent said none of their teachers assigned homework in their classes, and 32% remember all of their teachers assigning homework.

If the students were assigned graded homework, 63% of the students felt this only *helped a little* when they did their work, 32% said it *helped tremendously*, and 5% believed it *hurt their overall grade* because they would forget to do the work and/or turn it in (Figure 1).

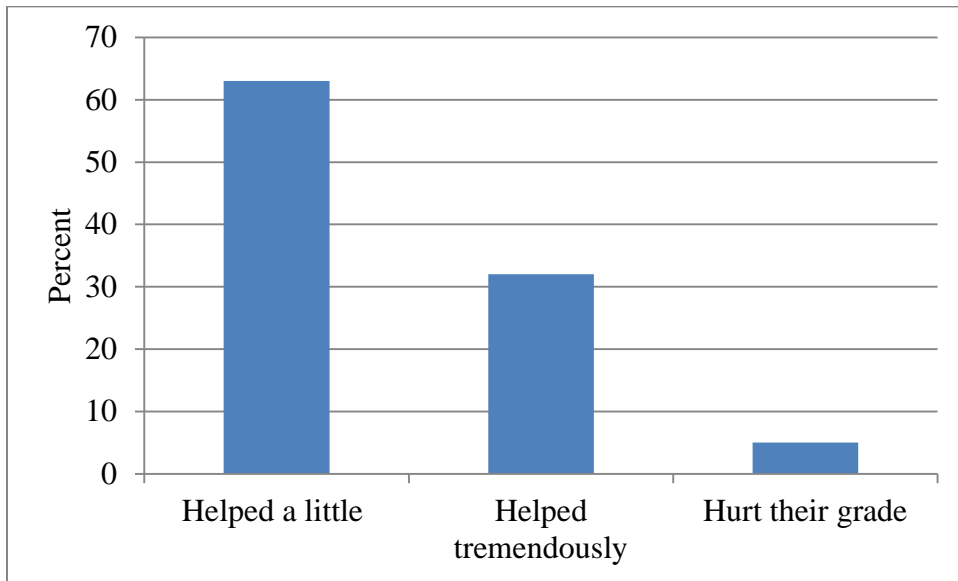
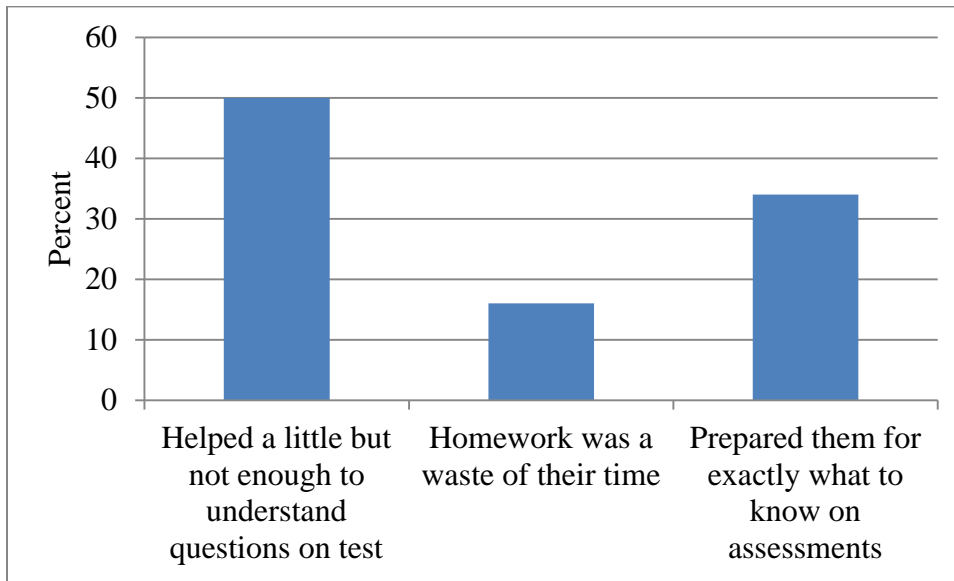


Figure 1. Graded Homework Effects on Overall Grades, ( $n = 68$ ).

Fifty percent of the students felt when they were assigned homework and took it home to work on their own, it only *helped a little bit but not enough to understand the questions on a unit test*. Sixteen percent believed they already knew how to do the problems, or they didn't know how to do them at all, so the *homework was a waste of their time* because it did not prepare them for the unit test. Another 34% of the students thought when they were assigned homework it *prepared them for exactly what they should know on the assessment* (Figure 2).



*Figure 2.* Graded Homework Effects on Tests Scores, ( $n = 68$ ).

Out of the homework they were assigned to take home to work on their own, 60% felt they knew what they were doing but would have to ask a friend or parent for help once in a while. Twenty-seven percent said it was easy, and they completed the assignment quickly, on their own, and never needed help. Another 13% of the students struggled on the homework problems and had to ask for help often in order to complete the assignment.

The last question on the survey asked whether students used the class time given to work on homework problems so they would not have to take as much home. Sixty percent of the students said they worked during class until the bell and then took the assignment home to finish. Thirty-seven percent worked during the time given at school but usually did not take it home to finish. Three percent never did their homework, even when given time in class to complete it.



Looking at individual average scores, 32% of the students scored an average of one indicating they *usually always did their work without issues or having to ask questions for help*. Of the students who usually tried to do their work, 66% of them *would struggle and have to ask questions to complete the assignment* scoring an average of two. An average of three indicated those students who *hated doing homework, would occasionally do it, and struggled to complete every assignment*. From the survey results, only one student scored in the range of a three (Figure 3). Overall, the majority of the students who were assigned homework in middle school would at least attempt to do the work, but many of them would have to ask questions occasionally in order to complete the work.

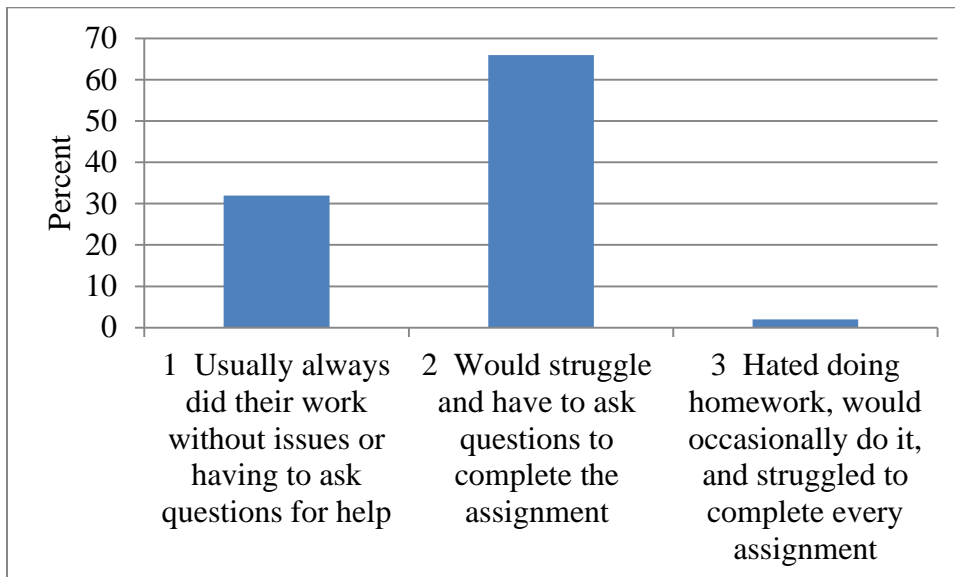
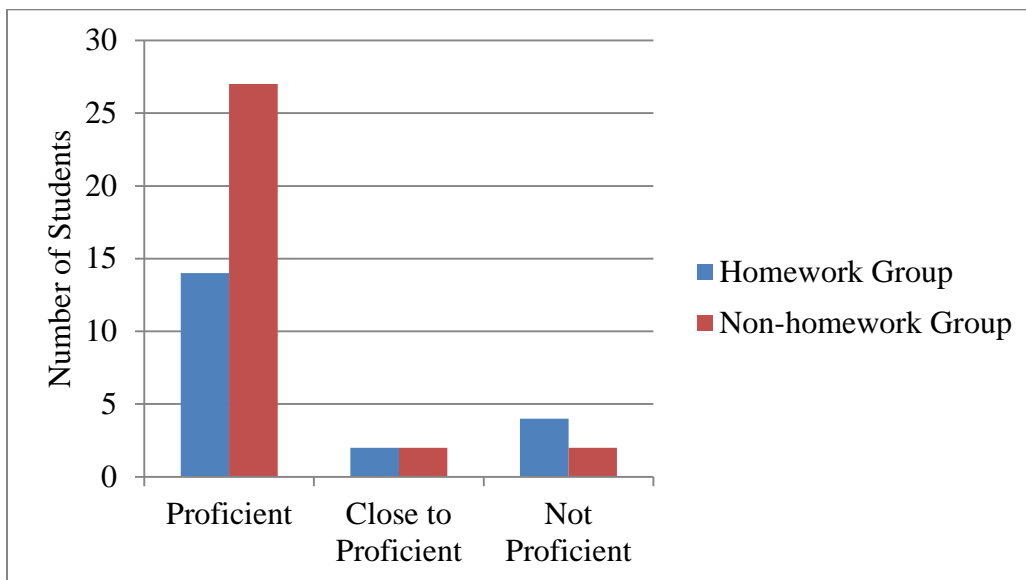


Figure 3. Students with Averages in Ranges of 1-3, ( $n = 68$ ).

The first unit of the second semester covered chapter two. After the chapter two test was given, the first treatment group, who had homework assigned and graded, scored an average of 73% on the test. On the last ten questions of the test, which were the same

as their pretest, 14 students scored proficient, two were close to proficient, and four students were not proficient. The class whose assignments were simply reviewed together and not graded averaged an 82% on their test. Based on the data of the last ten questions, 27 were proficient, two were close to proficient, and two students were not proficient (Figure 4).



*Figure 4.* Students Proficient on Chapter 2 Posttest, ( $n = 20$ ) ( $n = 31$ ).

After this first test was graded and entered into the grade book, the students' overall grades were documented. The treatment group only had two students with an overall grade in the A range, while eight students were currently failing. This was due to several students having missing homework scores. The non-treatment group had much better overall grades with only one student failing and eleven of the students with an A (Figure 5).

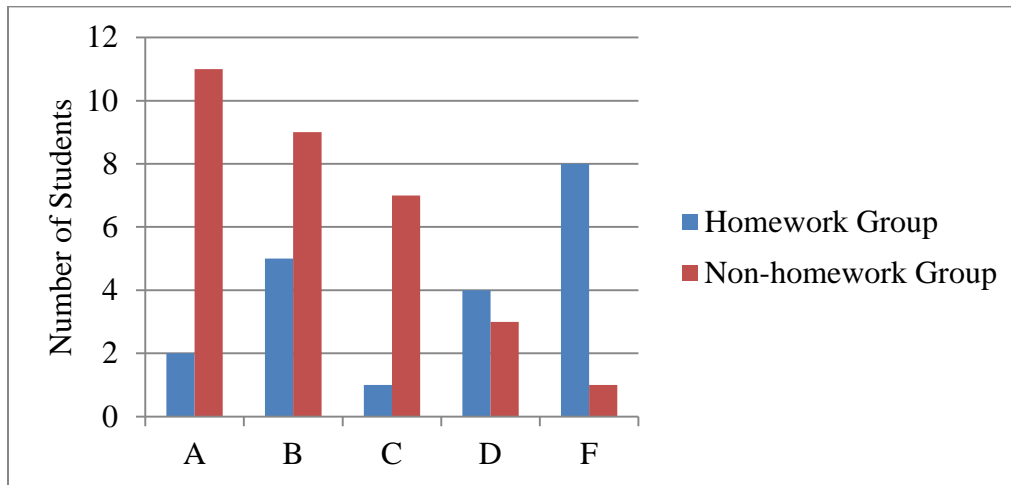


Figure 5. Student Overall Grades after Chapter 2 Test, ( $n = 20$ ) ( $n = 31$ ).

When the Midway Interview was administered after the first chapter test of the semester, 100% of the students whose homework was not graded liked not having to complete their work and turn it in for a grade ( $N = 6$ ). One student said, “I like the homework not being graded because when it’s graded it is stressful knowing you could get some wrong.” Another student said, “I like that it’s not graded because one time I took my homework home and spent a long time working each problem and still got a bad grade on it, which then hurt my overall grade.”

When the treatment group was asked how they felt so far on homework begin graded, 67% said they liked having it graded ( $N = 6$ ). One student said, “I like it being graded because it’s easy points.” Another student said, “Actually getting graded on the work makes me do the work, which helps for tests.” There were, also, a few students who did not like having their homework graded. “Sometimes it’s pointless because I already know how to do the work,” said a student who had an overall grade of a C but scored an A on the chapter test. A student who was failing the class because he had not

turned in a single assignment, but scored a 70% on his test said, “I hate that the homework is graded because it feels like a waste of my time.”

The two students in the treatment group who currently had an A in the class both felt their overall grade would not be affected if homework was not graded because they stay on task and get good grades on their tests. Two students who were scoring in the C range felt if homework was not graded they would be doing better overall. One student said, “It would probably help my grade because sometimes when I get home I forget how to do the work which brings my homework grade down.” The students who were failing after the first test felt their overall grade would be better if homework was not graded because they knew the material and did well on their test.

The non-treatment group was asked the same questions based on their current overall grade. Fifty percent felt having their homework graded would help their overall grade because they were easy points, while the other 50% said it would not help their overall grade. One student said, “Homework would not help my grade because I wouldn’t take it home to complete.” Another student said, “No, it wouldn’t help because at home I don’t have anyone to help me when I have a question.”

With students moving and being switched to different classes, the number of students in each class changed from the previous test. After the second test of the semester over chapter three was given, the first treatment group scored lower than they did on the chapter two test, averaging 64%. On the last ten questions of the test, 6 students scored proficient, 3 were close to proficient, and 9 were not proficient. The non-treatment group scored an average of 73% on their test. Based on the data of the last ten

questions, 18 were proficient, 4 were close to proficient, and 8 were not proficient (Figure 6).

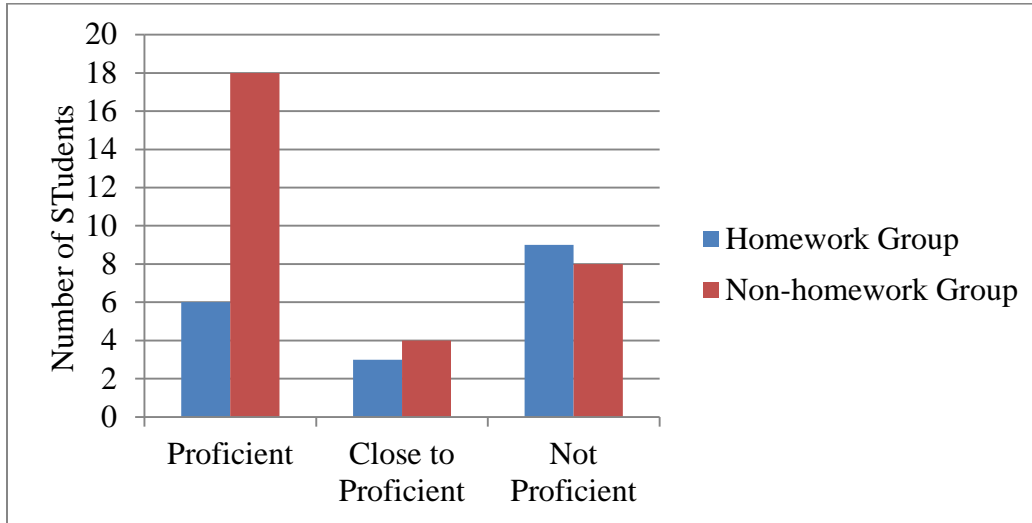


Figure 6. Students Proficient on Chapter 3 Posttest, ( $n = 18$ ) ( $n = 30$ ).

Overall grades were once again recorded after this test. The treatment group now had four students in the A range and only three F's. The non-treatment group stayed fairly the same with 10 students now with A's and three students with F's (Figure 7).

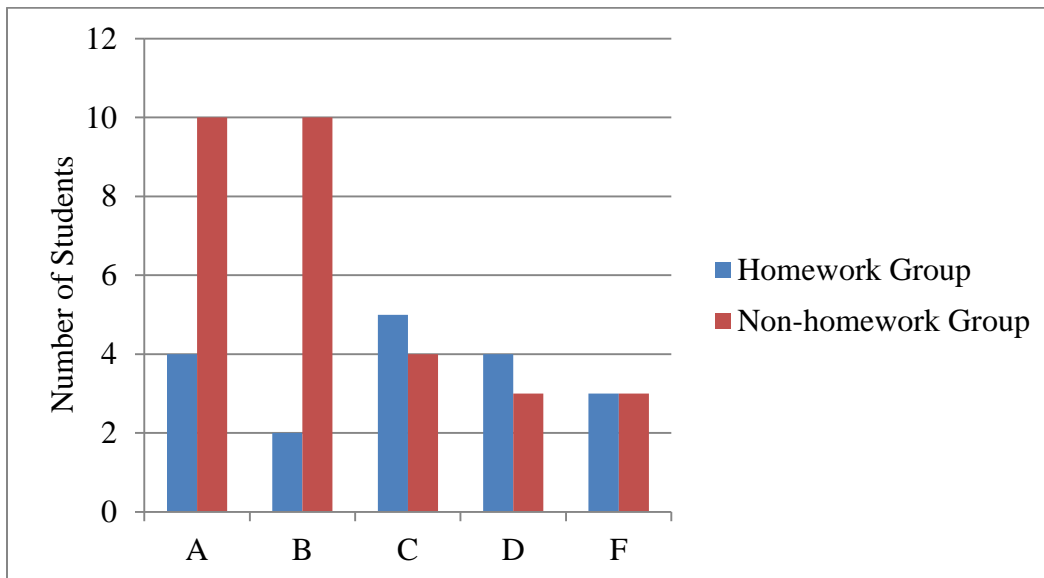


Figure 7. Student Overall Grades after Chapter 3 Test, ( $n = 18$ ) ( $n = 30$ ).

After the first treatment group completed the second chapter, the End Group One Survey-Graded was administered which indicated 41% of the students were able to finish their work on their own because they did not complete it at school ( $N = 17$ ). Another 41% said they still had to ask for help on certain questions. The remaining 18% of these students were lost and had no idea how to complete the problems.

When the students had to finish the assignment on their own, they were asked what they did when they got stuck on a problem. Not a single student indicated they never got stuck on problems. Eighty-two percent of the students marked they had to ask their parents or friends for help, while 18% admitted to asking their friends for the answers or cheating off another's paper.

When the graded assignments were handed back to the students, 41% said they reviewed what they missed and used it to study for the test. Twenty-four percent of the students looked at their scores, but did not use it to study for the test. The remaining 35% of the students simply looked at their assignment grade then threw the assignment away.

The final question asked how having their homework graded affected their overall grade. Fifty-three percent of the students said it helped a lot because it was easy points in the grade book. Twenty-nine percent felt it helped a little but was a waste of their time. The remaining 18% believed it hurt their overall grade because they didn't know how to work the problems or they would forget to turn in the assignment.

The percentage of students in the treatment group who chose a one, two, or three for each question was calculated (Figure 8).

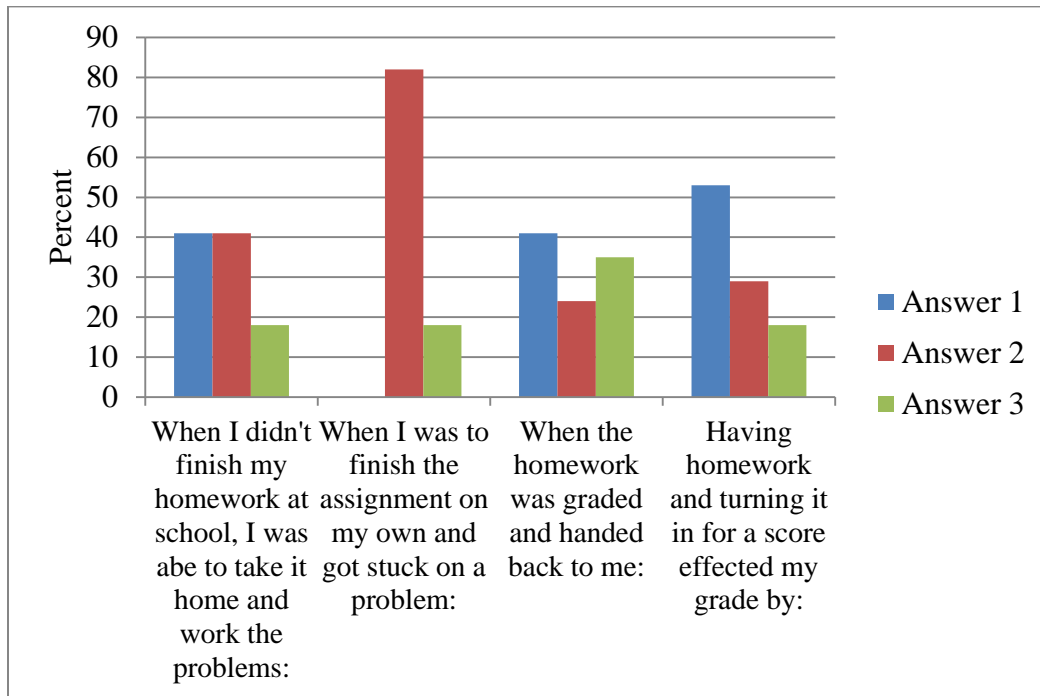


Figure 8. Percentage of Students in the Homework Group Who Answered 1-3, ( $n = 17$ ).

The End Group One Survey-Not Graded was, also, given to the non-treatment group which indicated 64% of students would still look over the problems they didn't complete so they would know how to do them ( $N = 22$ ). Thirty-two percent said they never worked any more problems because they felt they already knew how to do the work, and 5% never tried any of the problems because they knew they were not graded.

When asked about time given in class work, 23% felt they were able to work all of the problems without asking for help. Seventy-three percent usually knew what they were doing, but would have to ask for help once in a while when they struggled. Only 5% had to ask for a lot of help or sat and did nothing because they didn't know how to do the work.

The third question indicated that 32% said they still had to review the problems reviewed in class to understand what to do on the test. Forty-five percent of the students

said they understood how to do the problems from reviewing the problems in class and this prepared them for tests. The remaining 23% wished homework was required because this would force them to do the work, which would then help prepare them for tests.

The final question asked how not having to take homework assignments home affected their overall grade. Twenty-seven percent liked not having their homework graded because they weren't going to do the work, or it felt like a waste of the time since they already knew how to do the work. Sixty-four percent felt it didn't matter either way; it would have just been more work and points in the grade book. Only 9% of the students felt it hurt their overall grade because they wanted the easy homework points to offset their poor test scores.

Again, the percentage of students in the non-treatment group who chose a one, two, or three for each question was calculated (Figure 9).

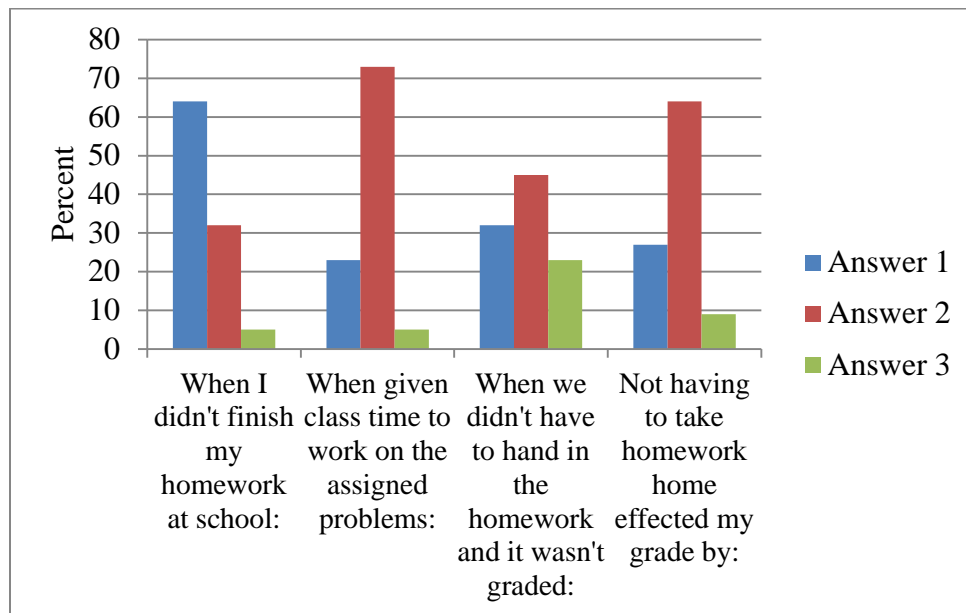
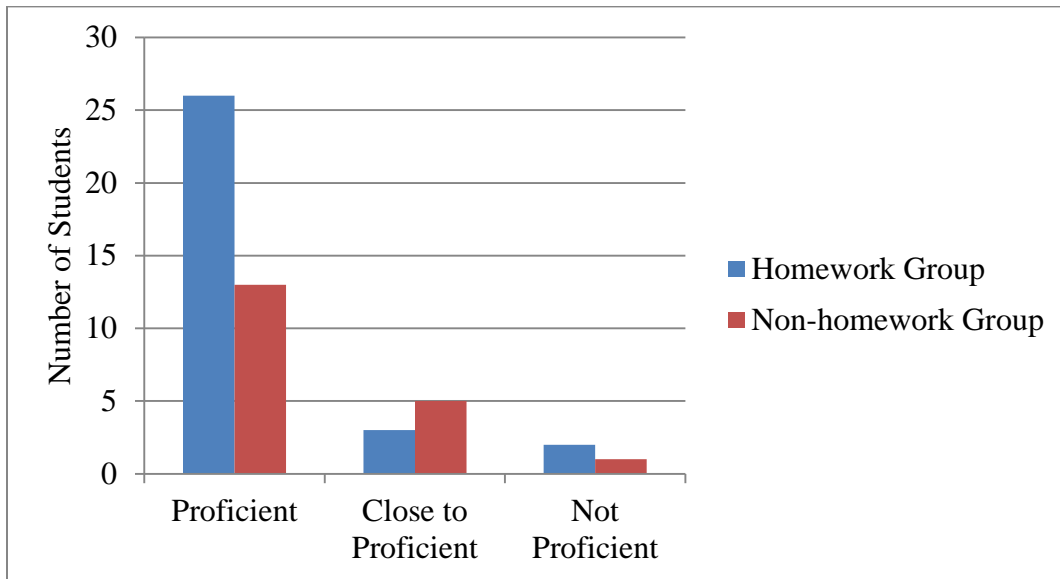


Figure 9. Percentage of Students in Non-homework Group Who Answered 1-3, ( $n = 22$ ).



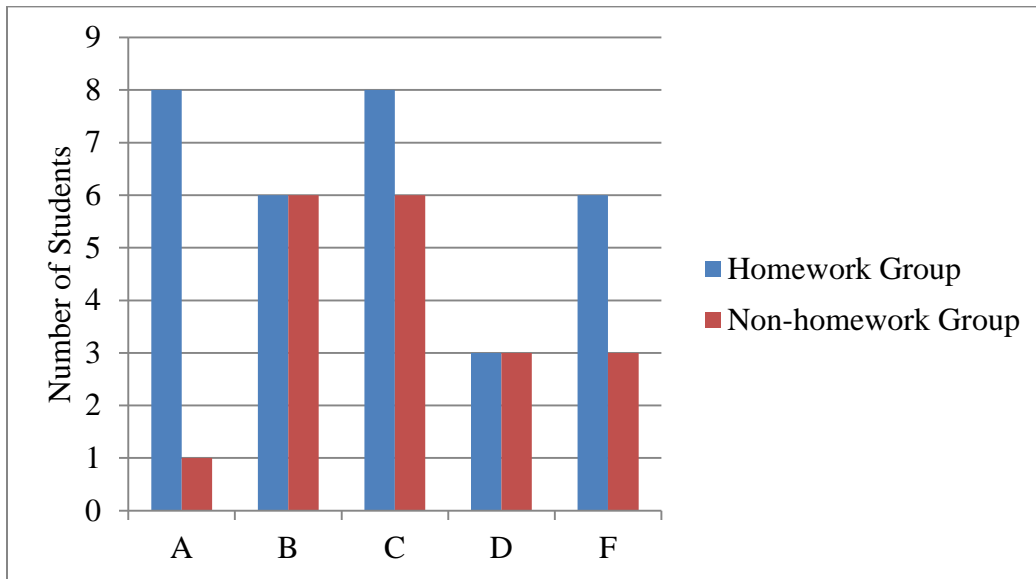
After the first two tests were given the two groups switched roles and two more chapters were pretested and tested over. When the chapter four test was administered, the second treatment group's average test score was 77%, nearly the same average from the first two chapter tests when their homework was not graded (78%). However, 55% of these students had a higher test average on the first two chapter tests when their homework was not graded than they scored on the chapter four test. On the last ten questions of the test, 26 students were proficient, three were close to proficient, and only two students were not proficient (Figure 10).

The new non-treatment group scored an average of 75% on their test, which was higher than the average test score when their homework was graded (69%). Sixty-three percent of these students scored higher on the chapter four test compared to their test average from the first two chapters when their homework was graded. Based on the data of the last ten questions, 13 were proficient, five were close to proficient, and only one student was not proficient (Figure 10).



*Figure 10.* Students Proficient on Chapter 4 (osttest, ( $n = 31$ ) ( $n = 19$ )).

Omitting all scores from the first two chapters, overall grades in just chapter four were recorded. The new treatment group's overall grades declined from when they were in the non-treatment group. Eight students were now in the A range compared to 10 students when their homework was not graded, and six other students were now failing, which was three more students than when they were in the non-treatment group. The new non-treatment group now had one student with an A, while three other students were still failing (Figure 11).



*Figure 11.* Student Overall Grades after Chapter 4 Test, ( $n = 30$ ) ( $n = 19$ ).

After students were done taking the chapter five test, the new treatment group's test scores went down to 71%. Based on the last ten questions again, 14 students were proficient, six were close to proficient, and 11 were not proficient. The new non-treatment group's test average decreased two percent to averaging 73% on the test. On their last ten questions, 11 students were proficient, five were close to proficient, and four were not proficient (Figure 12).

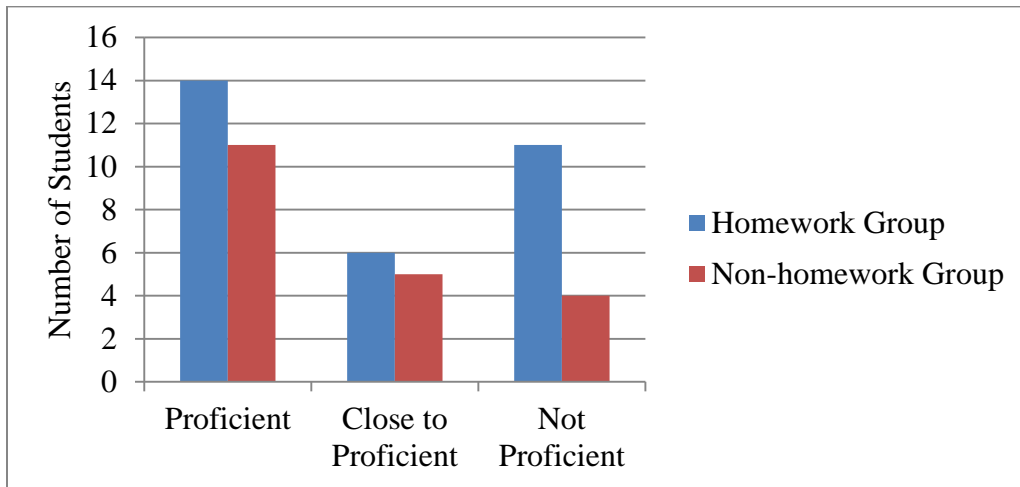


Figure 12. Students Proficient on Chapter 5 Posttest, ( $n = 31$ ) ( $n = 20$ ).

Overall grades from only chapters four and five were measured for both groups.

The treatment group now only had three students with an A and nine students were failing. The non-treatment group improved to three students with A's and only two students now failing (Figure 13).

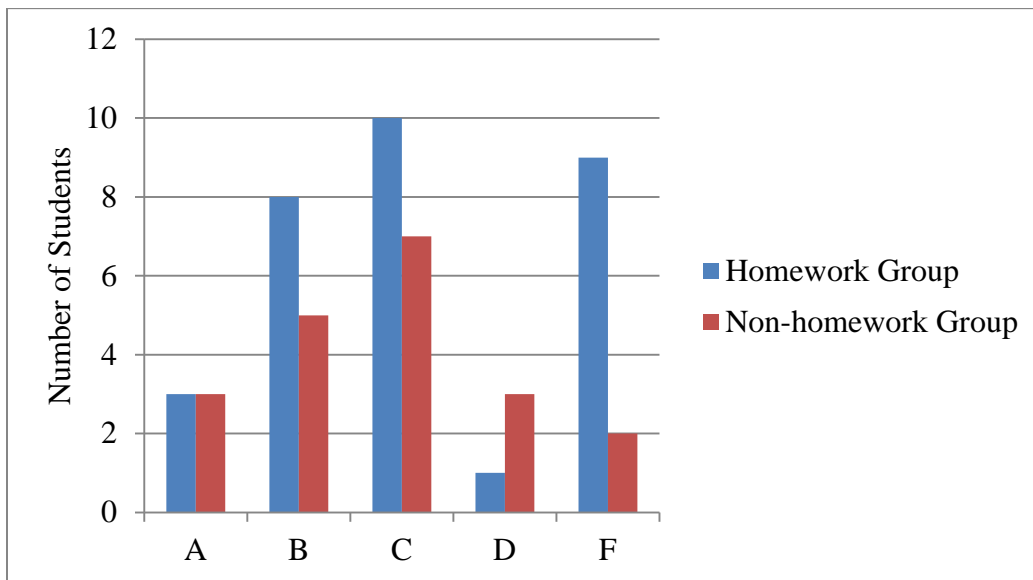


Figure 13. Student Overall Grades after Chapter 5 Test, ( $n = 31$ ) ( $n = 20$ ).

Test averages for each student from when they were in the treatment group compared to the non-treatment group were calculated and entered into a table. Based on these results, the first group scored better when their homework was not graded by 4% (Table 2). The second group also scored higher when their homework was not graded by 3% (Table3).

Table 2

*Test Averages from Homework Group to Non-homework Group*

Students	Homework Group	Non-homework Group
1	94	95
2	54	81
3	85	75
4	77	73
5	50	66
6	92	93
7	92	72
8	64	70
9	44	62
10	68	82
11	57	70
12	77	73
13	54	70
14	94	92
15	40	42
16	81	74
17	48	55
18	78	84
19	67	73
20	54	67
Total	69	73

Table 3  
*Test Averages from Non-homework Group to Homework Group*

Students	Non-homework Group	Homework Group
1	77	82
2	66	70
3	82	60
4	82	79
5	60	45
6	93	89
7	76	63
8	85	92
9	93	89
10	84	79
11	88	78
12	57	79
13	69	72
14	83	84
15	93	86
16	82	84
17	60	62
18	85	93
19	64	48
20	86	63
21	84	84
22	86	75
23	62	52
24	78	73
25	82	87
26	70	68
27	69	66
28	70	75
29	83	89
30	74	74
31	85	70
Total	78	75

After both classes had been a part of the treatment group, the End of Homework Research Survey/Questionnaire was administered to the two classes indicating 63% of the students felt they understood the material better when their homework was graded ( $N = 38$ ). Fifty-eight percent of the students also felt more prepared for a test when their

homework was graded. Fifty-five percent graded homework when deciding their overall grade (Figure 14).

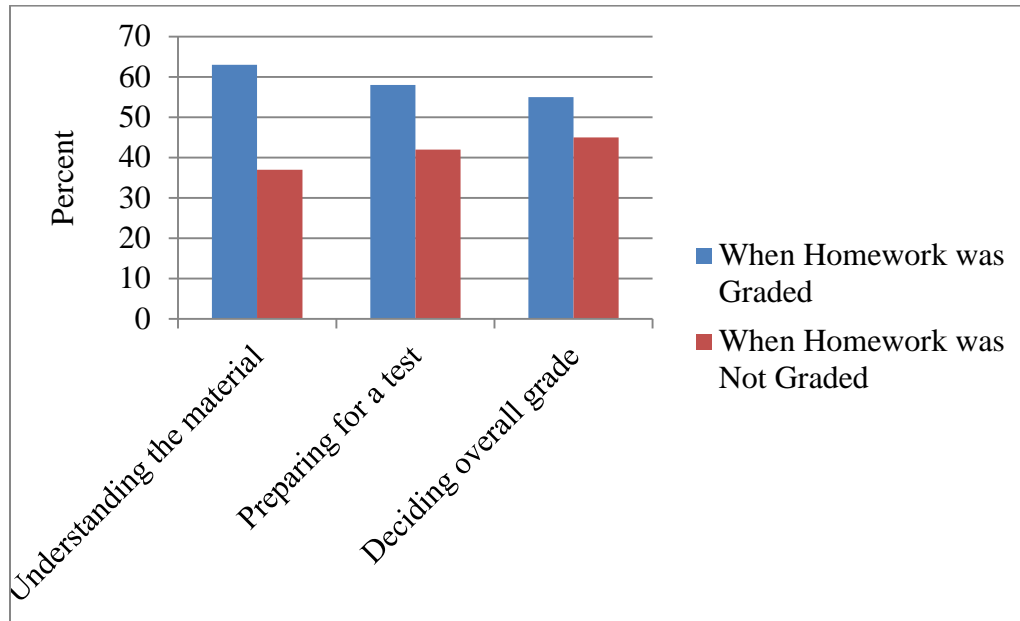


Figure 14. Percentage of Students Who Preferred Graded vs. Not Graded, ( $n = 38$ ).

When asked questions about their homework not being graded, 47% of the students said they felt prepared before taking a test. Forty-five percent of the students *sometimes* felt prepared while only 8% of the students said they did not feel prepared to take a test when their homework was not graded.

When the students were asked if they still did their work in class and asked questions when unsure, 55% of the students said *yes*. Forty-two percent said they *sometimes* still did their work, and only 3% admitted to not doing their work when homework was not graded.

The next question pertained to if the students knew they still had to do their work in order to pass the test. Seventy-four percent said *yes*, 26% said *sometimes*, and not a single student said *no* (Figure 15).

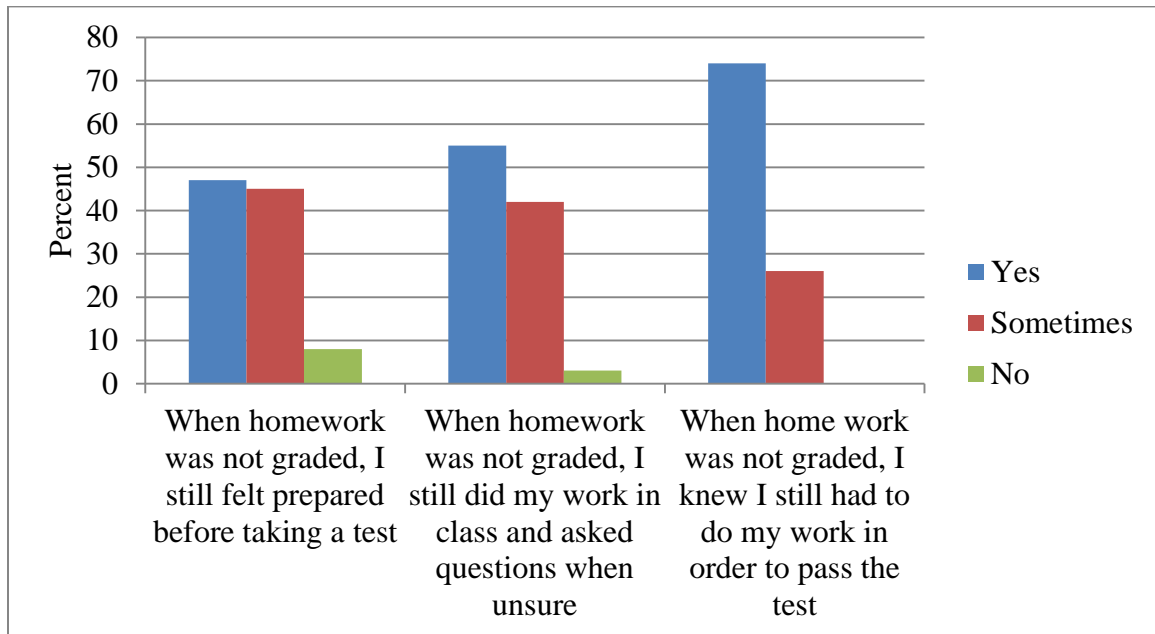


Figure 15. Student Feelings on When Homework Was Not Graded, ( $n = 38$ ).

The last question on the survey asked in their opinion, overall did they prefer having their homework graded or not graded. Seventy-four percent of the students favored not having their homework graded. One student stated, “It was less work I have to do with everything else I have in my other classes.” Another student said, “I liked when the homework was not graded because I didn’t have to worry about it not getting done.” One last student, also, preferred not having it graded because, “If I did the homework wrong, it brought my grade way down.”

Other students liked having their homework graded. One student stated, “Having my homework graded allowed me to know what I had to study if I got the problem wrong.” Another student said, “I preferred it to be graded because it was easy points that helped my grade.” One last student felt “When the homework was graded it made it more of a challenge for me.”



The overall findings from the End of Midterm Survey/Questionnaire were inconclusive in that the majority of the students felt that graded homework helped them understand the material, prepared them for the test, and factored in to their overall grades (Figure 14). However, 74% of the students knew that they still needed to do the work in order to pass the test when homework was not graded (Figure 15), and on the last question of the survey 74% of the students favored not having their homework graded for a variety of reasons.

Once the study was completed the data was once again re-evaluated to examine the impact that graded versus non-graded homework had on test scores, proficiency and overall course grades. A weighted average was calculated over the four test scores for the students in the non-treatment group and then again for the four test scores for the students in the treatment groups. The test average when homework was not graded was 75% and it was 72% when the homework was graded (Table 4). Similar results were obtained when a student's individual test score averages were compared (Table 2 and Table 3). This suggests that graded versus non-graded homework does not have a significant effect on test scores.

Table 4  
*Average Test Scores Comparing Graded Verses Non-Graded Homework*

Non-homework group test scores				Homework group test scores			
Test	Average Test Score	Number of Students	Quality Points	Test	Average Test Score	Number of Students	Quality Points
Chapter 2	82%	31	2542	Chapter 2	73%	20	1460
Chapter 3	73%	30	2190	Chapter 3	64%	18	1152
Chapter 4	74%	19	1406	Chapter 4	77%	31	2387
Chapter 5	73%	20	1406	Chapter 5	71%	31	2201
Weighted Average	75%			Weighted Average	72%		

In a similar manner the overall proficiencies for the two groups were calculated, which indicated a 69% proficiency ( $N = 100$ ) when homework was not graded and a 60% proficiency ( $N = 100$ ) when homework was graded (Table 5). The 9% gap between non-graded and graded homework may be significant enough to warrant additional study in this area.

Table 5  
*Effects of Graded/Non-Graded Homework on Student Proficiency*

	Non-homework group proficiency Number of proficient students	Homework group proficiency Number of proficient students
Test 1	27	14
Test 2	18	6
Test 3	13	26
Test 4	11	14
	Average Percent Proficient = 69%	Average Percent Proficient = 60%

The one area that graded homework did have a significant effect on was the overall course grades. At the midpoint in the study, after the first two tests, 80% of the students whose homework was not graded had at least a C in the class and only 10% of the students were failing ( $N = 30$ ). When the homework was graded only 61% of the students had at least a C and 18% of the students were failing ( $N = 18$ ). At the end of the study, after the last two tests were given, the overall grades were once again examined and this time 75% of the students had at least a C when the homework was not graded and only 10% of the students were failing ( $N = 20$ ). When homework was graded the percentage of students receiving at least a C was 68%, however 29% of the students were

failing the class ( $N = 31$ ). Combining the two groups together averaged 13% more students with a C or higher when homework was not graded. Also, there was a 14% decrease in the number of students failing when their homework was not graded (Table 6).

Table 6  
*Effects of Graded/non-graded Homework on Overall Course Grades*

	Non-homework group overall grades						Homework group overall grades				
	A	B	C	D	F		A	B	C	D	F
Grades After Tests 1&2	10	10	4	3	3		4	2	5	4	3
Grades After Tests 3&4	3	5	7	3	2		3	8	10	1	9
Total number of students with each grade	13	15	11	6	5		7	10	15	5	12
Percentage of students with a C or higher grade	78%						65%				
Percentage of students with an F for a grade	10%						24%				

### INTERPRETATION AND CONCLUSION

This study was undertaken to examine the impact that graded verses ungraded homework has on not only the proficiency of students in ninth grade physical science but, also, on their overall grades in the class. As the literature suggests the true effect of

homework on academic achievement has been a controversial topic throughout the years. The amount and rigor of homework has cycled over time in this country. The need in the United States to succeed and be number one in education worldwide has often been countered by society's need to protect the physical and psychological needs of our youth. About the only thing that all parties agree upon is the instructional purpose of homework, namely to provide the student with an opportunity to practice or review material that has already been presented in class. The real question is whether the homework needs to be graded in order to achieve this instructional goal.

This study provided evidence that ninth grade students in physical science do not need to be assigned graded homework in order to be proficient on chapter tests or pass the class with an above average grade. These findings were similar to those reported by Erin and Henderson (2001). In their study homework had a large positive effect on test scores in math, but had little effect on test scores in science, English, and history.

Marzano (2007) believes that if schools discard homework entirely they would be throwing away a powerful learning tool. In no way did this study intend to discard the role of homework in achievement. In both of the non-treatment groups, students were still doing the daily work in order to understand the material for the tests. It's just that the majority of the students were still proficient on the tests without having the homework graded. In fact the students whose homework was not graded had approximately a 9% higher proficiency on tests than those students whose homework was graded. This may have been due in part to the format used in class. On the day homework was assigned students were given time in class to start the homework, ask questions as problems arose, or just check their answers. Then the following day the

homework problems were discussed and reviewed as a group. Whereas, when the homework was graded it was up to the students to review the corrected answers on their own. Perhaps, going over homework in class the next day as a group had a greater impact on proficiency than letting the students go over the assignment on their own. This observation was supported by the end group survey in that the overwhelming majority of the students enjoyed this opportunity in class instead of just taking homework home and trying to remember how they worked the problems in class. The survey further indicated that when the students knew that the next day they could ask questions and/or check the work completed they tended to be more focused to comprehend how to work the problems the second time around.

The greatest impact of graded homework was on the overall course grade for the student. The research showed a significantly lower percentage of students in the A, B, C range and significantly larger percentage of students in the F range when homework was graded. Several factors have been cited for lower homework grades, which in turn may lead to lower overall course grades. These factors include a failure to finish the assignment, failure to even return the assignment, or losing points for incorrectly answering questions or solving problems. Since unit tests are intended to evaluate a student's overall proficiency, why should the student be penalized for failure to complete or understand the homework the first time it is presented?

Although this was a small study involving a relatively small number of students, the preliminary results suggest that student proficiency is not compromised by not grading homework. Furthermore, the results indicated that for many students graded homework may have a negative impact on the student's overall course grade.

## VALUE

The value of this study was twofold. First and foremost would be the impact that the study had on my students in that the overall majority of my students came from very low socioeconomic households. As a result, these findings may vary significantly when applied to other demographic groups. The surveys conducted throughout the study allowed my students to express their feelings about homework and explore which type of learning environment would benefit them the most. Some students preferred learning when homework was graded, some preferred guided practice in class followed by a review the next day, and there were some that needed additional time and remediation in order to be successful. No matter which homework path was followed the overwhelming majority of the students realized that some type of work needed to be done in order to be proficient over the material. Finally, I thought it was beneficial to the students to have a visual picture of what can potentially happen to their overall grades when graded homework was not completed.

The second valuable aspect of this study was for me as a teacher. Although the research conducted in my two physical science classes was only a small sampling of our freshman physical science students, it did provide evidence to suggest that grading homework may have a negative impact on many of the students' overall course grades. Even though this is suggested, additional time will need to be spent in the future examining the impact of graded verses non-graded homework.

I feel that, as a teacher, I not only need to provide a learning environment that will allow my students to flourish and be as successful as possible, but, also, an environment where the students can take some ownership of their own education. With such a variety

of students in each class it became apparent that no one method of assessing homework would fit the needs of each student. Therefore, another major consideration for next year is to develop a homework policy that will attempt to accommodate each of my student's individual needs. One factor that I will take in to account would be to provide students access to an answer key to homework problems, so they can self-check their work as they go along. The other possibility would be to make the homework an optional grade. If the homework grade became a smaller percentage of the overall grade, the students could have the option of completing and checking their own homework to receive this grade. However, if the student chose not to complete and check all of the homework this score could be exempted in the grade book. My role in the grading would then be to scan the homework assignments for completion. Grading homework in this manner is one way for the students to take ownership of their education.

Two beneficial aspects of this study that I plan to continue with next year will be allowing students some guided practice time in class to start their homework, ask questions and/or check answers. Secondly, time will still be allowed in class the next day to review and discuss any problem areas encountered. This provided time will allow the students who have already completed and checked their homework additional review of the materials, while taking the pressure off of those students who did not complete and/or understand the homework.

Finally, one of the best impacts of this study on me as a teacher came from my students themselves. The surveys and interviews really opened my eyes to some of the educational challenges facing some of them. I am hoping that by changing my

homework policy and continuing in class discussions, I can better reach the individual needs of all my students.



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APPENDICES

APPENDIX A

PROJECT EXEMPTION FROM MONTANA STATE UNIVERSITY



**INSTITUTIONAL REVIEW BOARD**  
**For the Protection of Human Subjects**  
**FWA 00000165**

960 Technology Blvd. Room 127  
 c/o Immunology & Infectious Diseases  
 Montana State University  
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 Telephone: 406-994-6783  
 FAX: 406-994-4303  
 E-mail: cherylj@montana.edu

*Chair:* Mark Quinn  
 406-994-5721  
 mquinn@montana.edu  
*Administrator:*  
 Cheryl Johnson  
 406-994-6783  
 cherylj@montana.edu

**MEMORANDUM**

**TO:** Angie Jenkins and John Graves  
**FROM:** Mark Quinn, Chair *Mark Quinn CTJ*  
**DATE:** October 24, 2013  
**RE:** "The Effects of Individual Grades and Test Scores When Assigning and Grading Homework in a Ninth Grade Physical Science Classroom" [AJ102413-EX]

The above research, described in your submission of October 23, 2013, is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal regulations, Part 46, section 101. The specific paragraph which applies to your research is:

- (b) (1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
- (b) (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.
- (b) (3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.
- (b) (4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.
- (b) (5) Research and demonstration projects, which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.
- (b) (6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed, or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the FDA, or approved by the EPA, or the Food Safety and Inspection Service of the USDA.

Although review by the Institutional Review Board is not required for the above research, the Committee will be glad to review it. If you wish a review and committee approval, please submit 3 copies of the usual application form and it will be processed by expedited review.

APPENDIX B  
PRE-SCHOOL YEAR HOMEWORK SURVEY

## Pre School Year Homework Survey

"Participation is voluntary, and you can choose to not answer any question that you do not want to answer, and you can stop at any time."

"Your participation or non-participation will not affect your grade or class standing."

On a scale 1-3 please indicate how you currently feel about grading homework.

1. In middle school most of my teachers assigned homework, which was required to complete at home, and be brought back to school to be graded and entered into the grade book.

- 1 All of my classes/teachers
- 2 Some of my classes/teachers
- 3 None of my classes/teachers

2. If any of your homework was graded and calculated into your grade, how much do you feel this helped your grade?

- 1 Helped tremendously
- 2 Helped a little when I did my work
- 3 Hurt my grade because I forgot to do my work or turn it in

3. When you were assigned homework, how much do you feel the homework you worked on your own at home, helped you prepare for chapter tests?

- 1 Prepared me for exactly what to know on the tests
- 2 Helped a little but not enough to understand the questions on the test
- 3 I already knew how to do the problems OR I didn't know how to do them at all so homework was a waste of time and did not prepare me

4. When I worked homework at home on my own:

- 1 It was easy, I completed my assignments quickly and on my own with no help
- 2 For the most part I knew what I was doing but had to ask my friends or parents for help once in a while
- 3 I struggled on homework problems and had to ask for help often

5. When I was given class time to work the homework problems:

- 1 I worked until the bell and then took it home and finished the assignment
- 2 I worked during the time at school but usually didn't take it home to finish
- 3 I usually never did my homework

APPENDIX C  
MIDWAY INTERVIEW

Midway Interview

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

Students with overall grade of A

1. What types of things have helped you achieve an A thus far in the class?
2. How do you feel so far on homework assignments being graded? (Or not graded)?
3. Do you feel your grade would be worse if homework was graded? (Or not graded)?
4. Is there anything else you would like to add?



### Midway Interview

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

#### Students with overall grade of C

1. At this point do you feel your grade could be better than a C or are you really happy that you're up to a C?
2. How do you feel so far on homework assignments being graded? (Or not graded)?
3. Do you think if homework was graded (or not graded) it would help your grade more?
4. Is there anything else you would like to add?

## Midway Interview

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

Students with overall grade of F

1. What types of things do you believe have brought you down to this grade?
  
  
  
  
  
  
  
  
  
  
  
2. How do you feel so far on homework assignments being graded? (Or not graded)?
  
  
  
  
  
  
  
  
  
  
  
3. Do you think your grade would be better if homework was graded? (Or not graded)?
  
  
  
  
  
  
  
  
  
  
  
4. Is there anything else you would like to add?

APPENDIX D

END GROUP ONE SURVEY-GRADED

## End Group One Survey (Homework Graded)

"Participation is voluntary, and you can choose to not answer any question that you do not want to answer, and you can stop at any time."

"Your participation or non-participation will not affect your grade or class standing."

On a scale from 1-3 please circle the number that correlates to how you currently feel about your homework being graded.

1. When I didn't finish my homework at school, I was able to take it home and work the problems:

- 1 Easily finish on own
- 2 I still had to ask for help on certain questions
- 3 I was lost when trying to work the problems on my own

2. When I was to finish the assignment on my own and got stuck on a problem:

- 1 I never got stuck on a problem
- 2 I had to ask my parents/friends for help
- 3 I asked my friends for the answers and/or cheated off their paper

3. When the homework was graded and handed back to me:

- 1 I looked at my score, reviewed what I missed, and used it to study for the test
- 2 I looked at my score, kept it, but never look at it again
- 3 I looked at my score and threw it away

4. Having homework and turning it in for a score effected my grade by:

- 1 Helped a lot because homework problems were easy points in the grade book
- 2 Helped a little but felt they were a waste of my time
- 3 Hurt my grade because I didn't know how to work the problems or I forgot to turn the assignments in

APPENDIX E

END GROUP ONE SURVEY-NOT GRADED

## End Group One Survey (Homework Not Graded)

"Participation is voluntary, and you can choose to not answer any question that you do not want to answer, and you can stop at any time."

"Your participation or non-participation will not affect your grade or class standing."

On a scale from 1-3 please circle the number that correlates to how you currently feel about your homework not being graded.

1. When I didn't finish my homework at school:
  - 1 I still looked over the problems I didn't finish so I knew how to do them all
  - 2 I didn't work any more problems because I felt I already knew what I was doing
  - 3 I didn't work any more problems because I knew it was not graded
  
2. When given class time to work on the assigned problems:
  - 1 I was able to work all of them on my own without asking for any help
  - 2 I usually knew what I was doing but struggled once in a while and had to ask for help
  - 3 I sat and stared at my paper because I didn't know what I was supposed to do or how to work the problems. I had to ask for help alot
  
3. When we didn't have to hand in the homework and it wasn't graded:
  - 1 I still reviewed over the problems we reviewed in class the following day in order to understand them for the test
  - 2 I understood how to do them when we reviewed over the problems in class and this prepared me for the tests
  - 3 I wish we had turned in the homework problems because this would have forced me to do the work which would have helped me prepare for the tests
  
4. Not having to take homework home affected my grade by:
  - 1 It helped a lot because I wasn't going to do the homework anyways and/or it felt like a waste of time because I already knew how to do it
  - 2 It didn't matter either way: it would have just been more work and more points on my overall grade
  - 3 It hurt my grade because I need all the easy points to help offset my bad quiz/test scores

APPENDIX F

END OF HOMEWORK RESEARCH SURVEY/QUESTIONNAIRE

End of Homework Research Survey/Questionnaire

"Participation is voluntary, and you can choose to not answer any question that you do not want to answer, and you can stop at any time."

"Your participation or non-participation will not affect your grade or class standing."

For each of the following scenarios, circle which midterm you preferred, when homework was graded vs. when homework was not graded.

1. In understanding the material:

When Homework Was Graded                      When Homework Was Not Graded

2. In preparing for a test:

When Homework Was Graded                      When Homework Was Not Graded

3. In overall grade:

When Homework Was Graded                      When Homework Was Not Graded

Answer the following questions by circling Yes, Sometimes, or No.

4. When homework was not graded, I still felt prepared before taking a test.

Yes                                      Sometimes                                      No

5. When homework was not graded, I still did my work in class and asked questions when unsure.

Yes                                      Sometimes                                      No

6. When homework was not graded, I knew I still had to do my work in order to pass the tests.

Yes                                      Sometimes                                      No

7. In your own opinion, did you prefer having your homework graded or not and explain why.

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APPENDIX G

CHAPTER 3 STATES OF MATTER PRETEST

## Chapter 3 States of Matter Pretest

- Matter that has a definite volume but does not have a definite shape is a:
  - liquid
  - solid
  - gas
  - plasma
- The most common form of matter in the universe is:
  - liquid
  - solid
  - gas
  - plasma
- Most matter \_\_\_\_\_ when heated.
  - solidifies
  - contracts
  - expands
  - blows up
- According to the Kinetic Theory, the particles that make up matter are:
  - changing
  - not moving
  - in motion
  - sublimating
- The change of a solid directly to a gas is:
  - melting
  - boiling
  - sublimation
  - condensation
- During a phase change, the temperature of the substance:
  - increases
  - decrease
  - stay the same
  - both a and b
- The change of a solid into a liquid is:
  - condensation
  - sublimation
  - boiling
  - melting
- The theoretical point at which all molecular motion stops is:
  - freezing point
  - melting point
  - below zero
  - absolute zero
- According to Boyle's Law, if the temperature of a gas remains constant, when the volume increases, the pressure:
  - decreases
  - increases
  - stays the same
  - both a and b
- Matter that has a definite volume and definite shape is a:
  - liquid
  - solid
  - gas
  - plasma