THESIS TITLE
The Effects of Guided Notes for Students with Specific Learning Disabilities at the High School Level

AUTHOR: Michelle Carlson

DATE OF SUCCESSFUL DEFENSE: April 22, 2003

THE THESIS HAS BEEN ACCEPTED BY THE THESIS COMMITTEE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN EDUCATION

Dr. Jacqueline Thousand
THESIS COMMITTEE CHAIR

Leslie Mauerman
THESIS COMMITTEE MEMBER

SIGNATURE
DATE

SIGNATURE
DATE
The Effects of Guided Notes for Students with Specific Learning Disabilities at the High School Level

Michelle Carlson

California State University San Marcos
ABSTRACT

The present study focuses on a student note taking strategy and the effects it has on students' test results. Associations between past test scores, prior to the aid of the strategy, guided notes, to present test scores, after the aid of guided notes, as well as comparisons to another class period that will not benefit from being given guided notes, are examined. Also, student enjoyment of the subject was examined to see if there was a higher enjoyment level for them, and if they felt there were any improvements in their own comprehension of mathematics.

As a result of the note taking strategy being implemented, the class being effected had a 56% point increase from their pre-test to post-test score. However, the class being used as a control group had a 78% point increase from their pre-test to post-test score. Therefore, the implementation of this note taking strategy did not prove better than the conventional method.
CHAPTER 1

Introduction

What are the effects of guided notes for students with specific learning disabilities (SLD) at the high school level? Many teachers at the high school level assume that students have already been taught and mastered the skill of notes taking. Additionally, when students are permitted to use notes during tests, many students with learning disabilities do not have any notes of their own from which to draw. As a math teacher of students with disabilities, it has become obvious to me that many of these students have not obtained the necessary skills in order to take meaningful notes, which are helpful to them. When teachers interviewed students (Suritsky, 1992) they found that lower level skills such as spelling and handwriting often slow down their writing speed, which further added to their problems of keeping up with the lecturer. Further, in Suritsky’s research, he noted that when the students with LD did take notes, they were writing what the lecturer was saying verbatim, which is
a difficult task for even the non-disabled student (Suritsky, 1992). As stated in Boyle’s article “Enhancing the Note-Taking Skills of Students with Mild Disabilities (2001), special education students tend to be passive learners, and by taking notes they become more engaged and active learners.

The first step of analyzing this problem is to identify how much knowledge of the skills students have, in regard to taking notes, and then, to teach them strategies to help them become better note takers. The purpose of this research is to investigate the use of guided notes and the results they produce for raising learning disabled student’s test scores.

The research herein demonstrates that note taking is a process, which includes three steps. These steps are encoding, external storage, and encoding plus external storage (Kiewra, 1989). Encoding relates what one has just heard in a lecture, or just read, to prior knowledge. External storage is the act of writing the notes on paper, rather than storing in memory, to be drawn upon and then referred to at a later time.
Finally, encoding plus external storage includes taking the notes, relating it to prior knowledge, storing the notes on paper in a folder, and then refer to the notes at a later time, while understanding and remembering context. It has been proven that external storage improves and increases student test scores (Ganske, 1981; Quade, 1996; Rankin, 1999). Research has also proven that when students actively take notes, the concepts become clearer (Katayama, 2000). Therefore, the importance of this research plays a large role in supporting teachers, parents, and students and the success of students with SLD to comprehend content material to a greater degree.

Even though the research has proven these facts, it still has not answered what type of strategies work best and what is the general rate of success for SLD students. Therefore, the question still remains, what types of note taking skills are the most beneficial to students with SLD? The Cornell and Outline formats of note taking have proven to be ineffective for students with SLD. It shows that the students spend more time
trying to record the pertinent information rather than getting the key points. Again, this provides an example of the students writing down information verbatim. However, as stated in Boyle’s article (2001), giving students cued notes helps the students remain with the lecture and record fewer words. Yet, the study demonstrates that rate of comprehension increased, and that students tested higher than those who did not have notes at all. An example of cued notes would be teacher generated notes of his/her lecture with the main ideas at the top of each section in bold with the appropriate number of example spaces under for the student to fill in during the lecture. Guided notes are another method that closely resembles this. This is when a student is given full notes with key words missing so that they must learn to listen for important terms and only be responsible for filling those words into the notes page.

In Faber’s research (2000), it is noted that strategies such as, “webbing, concept mapping, two-column notes, KWL format, Power Notes, and graphic
organizers, "can all be instrumental in the success of students. Some strategies may be more beneficial to a particular student than others, depending on the type of learner the student is.

There are many limitations that an investigation such as this may have. First of all, the prior knowledge of each student is going to vary greatly. One cannot be assured that all the students have had the exact same prior teachers and strategies taught to them. Another variable would be the days a student is absent from the ongoing teaching of these strategies. Without getting all the exact same information, those who miss part of the information will be at a disadvantage. I.Q. levels of students with disabilities tend to vary greatly as well. Therefore, the learning potential for one student may be higher than for another student. One student may qualify for special education services and have an individualized education plan (I.E.P.), written for math goals while another may qualify for written language. Therefore, students with an SLD in the area
of written language may not score as high as students with disabilities in math.

Definition of terms:

1.) Specific Learning Disability (S.L.D.), Learning Disability (L.D.)

A pupil shall be assessed as having a specific learning disability which makes him or her eligible for special education and related services when it is determined that all of the following exist:
(a) a severe discrepancy exists between the intellectual ability and achievements in one or more of the following academic areas:
   a. oral expression
   b. listening comprehension
   c. written expression
   d. basic reading skills
   e. reading comprehension
   f. mathematics calculation
   g. mathematics reasoning;
(b) the discrepancy is due to a disorder in one or more of the basic psychological processes and is not the result of environmental, cultural, or economic disadvantages; and

(c) the discrepancy cannot be corrected through other regular or categorical services offered within the regular instructional program.

2.) Know, Want to Know, Learned (K.W.L.)

Graphic organizer divided into three sections labeled Know, Want to Know, and Learned. This organizer begins with a listing of all the information the students already know, prior knowledge, before beginning a lesson. After this list is compiled, a middle column is created, by a listing of topics that the students want to learn about in the lesson. Finally, the graphic organizer is revisited at the end of the lesson to list what the students learned. This organization method can be completed in one class period or it can be used throughout a unit, semester, or even a year.

3.) Individualized Education Plan (I.E.P.)
Each district, special education local plan area, or county office shall initiate and conduct a meeting for the purposes of developing, reviewing, and revising the individualized education program of each individual with exceptional needs. Each meeting shall be conducted with the I.E.P. team, which is comprised of the following people:

a. administrator, program specialist, or other specialist who is knowledgeable of program options appropriate for the individual who is qualified to provide special education

b. the pupil’s teacher

c. one or both of the pupil’s parents or legal guardians

d. the pupil, if appropriate

e. any other related services such as a counselor, school psychologist, adaptive physical education teacher, and speech therapist.
CHAPTER TWO

A Review of Literature

Note taking is an organizational tool that helps most students recall information given in a lecture for use at a later time. According to the USU Academic Resource Center’s article on Effective note taking strategies, a student does not just sit down and take notes. There are strategies to use before, during, and after to become more effective at taking notes. If the student knows what the lecture topic is or has pre-reading material to review, he/she needs to spend the evening prior to the lecture skimming the material. This will ensure that the student understands key terms and has an idea what the lecture will cover. If there are key terms that the student does not know or understand, he/she needs to look them up in the dictionary prior to the lecture. Finally, the student needs to be certain of experiencing adequate rest before the day of taking notes. On the day that the student engages in note taking, he/she needs to eat a healthy meal so energy level, are high. He/she needs to bring
writing supplies, plenty of dated and prepared, loose leaf paper as well as placing him/herself in a location away from distractions in the classroom. The student will write on only one side of the paper, saving the other side of the paper for further information at a later time. Additionally, the student may want to add paper with other notes or to rearrange them to make more sense for studying at a later time. The student is then ready to take notes effectively. Taking notes can be done in many different ways and can have many different styles. Different types of notes would include, outline format, Cornell style, and guided notes.

Note taking styles

Notes can take on numerous forms depending on the student. Notes can be written in a variety of formats, including an outline style, Cornell style, guided notes style, or however the student decides to record the information.

According to Boyle and Weishaar (2001), "notetaking during lectures serves two fundamental purposes: it aids
student understanding of lecture points and it serves to preserve lecture information in the form of notes, for later study" (p. 133). Furthermore, research has shown that if facts are contained in notes, then the concept has a 34% chance of being remembered, compared to information not included in the notes has only a 5% chance of being remembered (Howe, 1970, Longman and Atkinson, 1999). However, it has been found that students who have learning disabilities struggle in determining content or factual discrimination in lecture information and try to record exactly what the lecturer is saying (Suritsky, 1992). In this situation, the students are getting the key ideas from the beginning of the lecture but are missing the rest of the lecture as they are still writing what was said first. So, how important is it for students to take notes in class? In secondary classes, it was found that the majority of teaching is done through lectures and that student grades are derived from test scores, which cover the lecture information (Putnam, Deshler, & Schumaker, 1993). Therefore, taking notes is vital in order to
recall the lecture information for study and improve test scores.

Special educators collectively developed the idea of having another student in the same class take notes for the student with a learning disability. This gives both students the needed information to study and prepare for the test. However, in doing this, the student with a learning disability becomes a passive learner instead of an engaged listener (Ruhl, Hughes, & Gajar, 1990). Also, the student would be missing out on a large part of the learning process, which is derived from the act of note taking, thus losing out on comprehension (DiVesta and Gray 1972).

Therefore, the need to create a system, which made note taking easier, gave rise to various strategies for students who were struggling with this concept. "Guided" notes, which is a skeleton outline that lists main ideas and leaves blanks for students to fill in expanded details given by the presenter (Lazarus, 1991), was created and tested to see if students could actually take better notes and comprehend the information better.
in this way. It was found that once the students were trained to use this format they scored higher on tests (Lazarus, 1991).

The effect of note taking techniques has been investigated. It was found that students, who took notes and then wrote an essay on their notes, did not necessarily recall information better than those students who were just tested objectively without the essay. When both study groups were tested, there was no correlation between those using that strategy and those who did not (Kiewra, Benton, Risch, and Christensen, 1995). Also in that same research, the types of note taking styles were investigated to see which format helped students with their retention of the information the most. The three types of note taking studied were 1) the student's own format, 2) outline, and 3) matrix style. This study showed that those students who used the outline format performed the highest (Kiewra, Benton, Risch, and Christensen, 1995). Therefore, the inclusion of an essay accompanying the notes for testing was not proven to be a useful technique, and the outline
format of notes was clearly more beneficial to students than the other two named formats.

Yet, what many teachers were finding was that their students were not able to take notes as fast as the teacher was talking, and many times, as the students were still writing exactly what the teacher said and were missing what the teacher had moved on to and therefore, missing key points in a lecture (Weishaar, Boyle, 1999).
CHAPTER THREE

Methodology

In this study, the effects of the use of guided notes for students with learning disabilities, was examined. Despite the numerous findings dealing with note taking, it remains unclear what effects guided notes would have on student test performance for students ranging from ninth to twelfth grade in algebra.

Participants

The participants in this research were: 21 students, 14 male, and 7 female, enrolled at Mt. Carmel High School in Rancho Penasquitos, California, ranging in ages from 13 to 18 years of age. The ethnicity make up of each class is as follows: Period one has one African American male, four Caucasian males, one male and two females of the Hispanic heritage. In Period two, there are four male and four females who are Caucasian, 3 Pilipino males, and two Hispanic females. The ages in period one are as follows: one student is 13 years of age, three are 14 years old, two are 15, and two are 16. In period two, one is 13 years of age, four
are 14 years old, five are 15, two are 16 years old, and one is 18. These students are all registered for L/Algebra 1A/1B, which is a two-year Algebra class developed to progress at a slower pace. Two different classes were used for this research. The students had the opportunity to participate voluntarily and had to have either a parent’s signature for consent to participate or they were age 18. One class, first period, served as a control group and was used to compare the other class scores. The second period class spent half of each class period, which ranges from 25 minutes to 50 minutes, using the study notes and also participating in the study. There were incentives such as participation points, extra credit opportunities and more teacher-to-parent contact regarding positive work habits demonstration in class. All of the participants voluntarily gave their time and were protected by the “Ethical Principals of Psychologists Code of Conduct” (American Psychological Association, 1992.)
Materials

All participants and their individual family received a packet, which included the necessary information and consent form in order to participate in the study. First, each student filled out a participation consent form (see Appendix A). This legally protects both the researcher and the students who volunteer to participate in the study. The consent to participate also listed contact numbers to reach the researcher, the researcher's advisor and also the California State San Marcos International Review Board for the students and/or their parents to use as they felt the need for further information regarding the study. Next, each participant completed a pre-questionnaire form, which gave the students the option of rating each statement as a comment they strongly disagreed with, 1, to strongly agree, 5. The questions requested that the students rate their own opinions regarding feelings towards math and what their previous history in math was like (see Appendix B). Then, each student in the study, took a chapter 5 pre-test (see
Appendix C), which included twelve questions regarding slope, parallel and perpendicular lines, as well as the x-intercept, and y-intercept. Finally, the guided notes strategy was used to help teach the lessons to period two. (Refer to Appendices D-L to see Guided Notes) The notes were distributed to each student at the beginning of the period and as the teacher lectured and gave examples, the students would listen for the answers to place in the open blanks. After the study notes were given, the students took a post Chapter 5 test (Appendix M) to determine whether or not they scored higher than the students in the period one Algebra class, all of whom who did not receive guided lecture notes as support. The Chapter Five text post-test (Appendix M), was comprised of thirteen questions which covered the same information given in the pre-test, (see Appendix C).

**Procedure**

High school students from two separate math classes were offered the opportunity to participate in the study. The thrust of this experiment was presented to
students and all students were informed that they would not be penalized for not participating, and that results would be kept confidential and that it would not harm them in any way. Students were informed that the study would examine the effects of the guided notes strategy on their test scores and behavior towards mathematics. Participants who chose to participate were given a consent form, which was signed by a parent, unless they were 18 years or older. Students who chose to participate were given extra participation points in class for completing an interest inventory regarding math. Participating students took a pre and post-test of Chapter 5 by Pacemaker (see Appendix C and Appendix M). Period two Algebra students who chose to participate were given guided notes and were instructed how to complete them. Each day a new section of the curriculum was introduced, and the students in period two would receive one page of the guided notes. The teacher would lecture in a number of ways, varying from notes on the overhead to class discussion, also graphing on the board. As the presentation of the information
was given, students were instructed to carefully listen for the correct information to "fill in" the missing blanks on the guided notes page. As the students progressed through each section of the chapter, the guided notes left increasing numbers of blanks or concepts, for which the students had to complete his/herself from the lecture. Ultimately, this was teaching the students the process of how to take notes on their own. If extra time or make up sessions for missed days due to absence were needed, students were given the incentive to make it up by receiving tutorial credit for completing make-up work. Upon completion of the study, Ms. Carlson announced some of the general outcomes of the study to the students who participated. This researcher also gave the students information in class, so they could locate and read the entire study if they so desired at California State University San Marcos Library, in San Marcos, California.

Data Analysis

An Attitude Rating Scale (see Appendix B) was used to determine student individual feelings/thoughts about
math and their overall attitude toward the class was prior to using guided notes. After the conclusion of the guided notes and the completion of, the Chapter 5 Post-test, the students again took the Attitude Rating Scale. The students' opinions about math and how they perceived themselves as note takers and test takers were again examined. The researcher intended to find that the students had a better understanding of what was vital for their notes and that they would enjoy math more. A pre test for Algebra Chapter 5 was used written by Pacemaker (see Appendix C) and post-test for Algebra Chapter 5 was used (again by Pacemaker) see Appendix M. Both the pre and post-test were used for both classes, to be compared to each other, in order to determine if guided notes had a large impact on the learning and test taking performance of students with disabilities. Here, the researcher intended to determine whether or not the class that was taught with guided notes would score higher than the class without the extra support.
CHAPTER FOUR

Methodology

The data collection for this research began when the students were given the pre-interest inventory and Chapter 5 pretest. Both period one and period two completed these tasks prior to any interventions being applied. The pre-interest inventory score was averaged for each question for each class period. For example, if the first two students gave the answers of 3 and 4, those would be combined to make 7, then divided by two (which is the total number of students), to give an average of 3.50. Since there were eight students in period one and thirteen in period two, the total number for each question was then divided by the number of students in each class to give a decimal number rounded to the nearest hundredth so the two classes could be compared. The Chapter 5 pre-test was given on the same day in each class so that information about the test could not be shared. The guided notes strategy was taught and implemented in second period and Chapter 5 was taught over a forty-five day period to both classes.
The students were then again given the interest inventory and a Chapter 5 assessment. As before, the interest inventory answers were added up and averaged so that the two classes could be compared to one another. Finally, the Chapter 5 test was given and the results from each class are compared in Figures 1 and 2.

**Findings**

The presentation and utilization of the guided notes strategy for students with specific learning disabilities at the high school level did not appear to help the students' overall test scores as much as the standard method which was used in Period one. The pre-test average for Period one was a 7%, compared to a pretest average of 15% in Period two. However, looking at the final results after the implementation of guided notes, period one had a 78% point increase and period two had a 56% point increase.

Therefore, it is important to look at study habits, class preparation (such as if the student brought materials needed daily to class,) and how many of these students were availing themselves of the extra support,
as the need. Post Interest Inventory for Period 1 averaged a 3.38, 1 strongly disagree to 5 strongly agreed, to the question, “I know how to study and prepare for math tests,” as compared to an average of 3.54 in Period two. Therefore, period two, on average, thought they were more prepared to study for a test than period one, even though their test results did not show that. This would indicate that their test results were not lower because they felt they were unable to prepare themselves. Therefore, it is important to see which class felt they were prepared daily for class. In answering question number ten, period one averaged 3.75, whereas, the average of period two was 4.08. Again, period two felt that they were more prepared for class than period one thought they were.

Finally, looking at question nine, which indicated whether students sought help on their own, period one’s response averaged to 3.13 whereas, period two’s response was an average of 2.92. These findings indicate period one’s desire for self-advocacy was higher than that of period two. When looking at the daily Tutorial class
check-in sheet, period one had more students come in for tutorial than period two, who were not required to be there.

**Implications**

In comparing the two classes' test scores (pre and post) and also comparing their interest inventories; it was vital to know if IQ achievement/ performance scores had any implications that would impact the final results. Investigation yielded that both classes were comparable. Period one had an average IQ score of 84, (keeping in mind that one student is African American and, due to the Larry P vs. Riles case cannot be included in this comparison), and in period two the IQ average was 85. Therefore, there was not a significant enough discrepancy between the two to justify or explain why period one scored higher on the Chapter 5 test than period two.

In conclusion, what does this mean? Does the guided notes strategy really help students with a specific learning disability in high school score higher on their math tests?
CHAPTER 5

Conclusions and Implications

Summary

In this study, the researcher sought to reveal to what extent a guided notes strategy would help high school students with a specific learning disability perform on Algebra I chapter tests. Period one students were required to take their own notes and were used as the control group. Period two students were given guided notes strategy instruction, which decreased in teacher generated items notes and increased in blanks for students to use as time progressed. The researcher hypothesized that period two students would learn from the strategy what to listen for and write, in a guided setting, what was important fact. In decreasing the specific input from the teacher, and relying on listening skills, plus the auditory and cognitive discrimination abilities of students to develop and maintain skills which would positively impact test performance. Both period one and period two classes
were involved in this process and compared to one another in Figures 1 and 2.

The question of whether or not guided notes helped high school students with a specific learning disability in math was definitively answered. The first step was to pre-test participating students from both period one and period two on Chapter Five (Pacemaker). Both classes also took an interest inventory in the topic of math to ascertain what the feeling each period had towards the subject. Period one was taught the same information each day as period two throughout the forty-five day period until the conclusion of chapter five. The one difference was that period two had the guided notes strategy to help them study and learn the information given in chapter five, whereas period one was instructed to take notes independently. At the conclusion of chapter five, both class periods again took the interest inventory and a chapter five-post test. In comparing period one, (made up of eight students), to period two (make up of thirteen students), it became evident that period two, with the guided notes
intervention did not score higher than period one on the content of the final chapter five test (see Figures 1 and 2). The researcher sifted through the materials and examined each angle regarding the question of why period one could have scored higher than period two. In looking over the Interest Inventory point totals for each class, period two thought they were a more prepared group of students than did period one. Period two thought they were more prepared daily for class than period one, and they enjoyed the class more than period one. Additionally, this class thought of themselves as taking better notes than the students in period two felt towards their own notes taking skills. The only differences noted were that period two thought they could access and use their notes for the tests more easily, and they came in for more tutorial support on their own than period two did. The researcher considered factors that could have influenced period one to do better on the Chapter Five test than period two. That is why the IQ scores of each class were then
examined to no avail. The difference in the two classes was a one-point difference, in favor of period two.

**Significance**

What does this mean to the math field and the special education field in the area of strategies instruction? One inference could be that taking notes in the student's own format helps them better organize their notes. It could also mean that students actually absorb more information when they are required to take complete notes, rather than just "filling in the blanks" and listening for key words. In final discussions with period two, several students explained that they liked not having to take complete notes, but that it gave them time to "drift off" and not concentrate. They also admitted to "just getting what they had to," rather than listening for comprehension for the entire presentation of the concept. They commented that homework was more difficult because they did not remember being taught the material. However, when shown the concepts in their own notes, they realized that they did not understand what
Successful Note Taking 32

they were writing, because they were simply “filling in the blanks.”

Limitations

The limitations of this research would be that the researcher was not able to completely compare one class to another in terms of class size. Having one class size of eight and the other thirteen made the results not as clear or easy to compare than if both classes had been the same size. Another important fact to consider was that gender and ethnicity were not exactly the same in each class, either. Prior knowledge was also a key factor to look at in this research. Many of these students have not been educated from kindergarten through high school in the Poway Unified School District. Having used a relatively small sample size also did not generate as accurate results as a larger number of students involved might have. Finally, only using one comparison to draw upon for final conclusions is also a limiting factor.
Further questions

Do these limitations play an important role in the findings of this research? Did some of the students miss learning important concepts, or even how to take notes, due to changing schools? Finally, the notes the students took were math notes and therefore will they hold as true in mathematics as it might have in a language arts or history class? Did attitude play a factor?

Further research

The results of this study necessarily lead one to consider the possibilities of further research. For instance, what are the effects of guided notes in a language arts class or history class? How about within the Junior Highs within the same school district? What type of results would one gather in comparing students from one district to another or even from one state to another? Are some states doing a better job of implementing note taking skills than others? If so, what strategies and teaching materials are they using? There are many possibilities to extend this
investigation to answer some of these questions to gain a better overall conclusion to the question; does the guided notes strategy help high school students with a specific learning disability perform better?

**Conclusion**

In concluding this research, it gives valuable information for teachers and parents who work with young adults with learning disabilities and note taking in the mathematical field. The study also provides percentages of improvement from students' notes to guided notes distributed by the teacher. If the reader feels the improvement was significant enough, it is a practice that math teachers who teach students with disabilities will want to adopt and utilize in their classrooms. Procuring this information has been very beneficial to the researcher in working with over 50 students with disabilities each day in the area of mathematics because this strategy was just the beginning. Taking this information and continuing the research may eventually conclude in a better way of assisting students take notes.
References


Using Traditional Pencil and Paper and an on-line notepad during computer-delivered instruction.

Paper presented at Proceedings of Select Research and Development. Presentations at the National Convention of the Association for Educational Communications and Technology, Indianapolis, IN.


Clearing House, 72(6), 392-395.
Figure 1

Period One Chapter 5
Pre and Post Test Results
<table>
<thead>
<tr>
<th>Student</th>
<th>Chapter 5 Pre-Test (total correct/percentage)</th>
<th>Chapter 5 Post-Test (total correct/percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>2 out of 12 (17%)</td>
<td>8 out of 13 (62%)</td>
</tr>
<tr>
<td>Student 2</td>
<td>0 out of 12 (0%)</td>
<td>9 out of 13 (69%)</td>
</tr>
<tr>
<td>Student 3</td>
<td>4 out of 12 (33%)</td>
<td>13 out of 13 (100%)</td>
</tr>
<tr>
<td>Student 4</td>
<td>0 out of 12 (0%)</td>
<td>11 out of 13 (85%)</td>
</tr>
<tr>
<td>Student 5</td>
<td>0 out of 12 (0%)</td>
<td>11 out of 13 (85%)</td>
</tr>
<tr>
<td>Student 6</td>
<td>0 out of 12 (0%)</td>
<td>13 out of 13 (100%)</td>
</tr>
<tr>
<td>Student 7</td>
<td>0 out of 12 (0%)</td>
<td>11 out of 13 (85%)</td>
</tr>
<tr>
<td>Student 8</td>
<td>0 out of 12 (0%)</td>
<td>12 out of 13 (92%)</td>
</tr>
<tr>
<td>Class Total</td>
<td>6 out of 96 (6%)</td>
<td>88 out of 104 (85%)</td>
</tr>
</tbody>
</table>
Figure 2

Period Two Chapter 5
Pre and Post Test Results
<table>
<thead>
<tr>
<th>Student</th>
<th>Chapter 5 Pre-Test (total correct/percentage)</th>
<th>Chapter 5 Post-Test (total correct/percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>2 out of 12 (17%)</td>
<td>7 out of 13 (54%)</td>
</tr>
<tr>
<td>Student 2</td>
<td>0 out of 12 (0%)</td>
<td>8 out of 13 (62%)</td>
</tr>
<tr>
<td>Student 3</td>
<td>5 out of 12 (42%)</td>
<td>13 out of 13 (100%)</td>
</tr>
<tr>
<td>Student 4</td>
<td>0 out of 12 (0%)</td>
<td>10 out of 13 (77%)</td>
</tr>
<tr>
<td>Student 5</td>
<td>0 out of 12 (0%)</td>
<td>5 out of 13 (38%)</td>
</tr>
<tr>
<td>Student 6</td>
<td>0 out of 12 (0%)</td>
<td>10 out of 13 (77%)</td>
</tr>
<tr>
<td>Student 7</td>
<td>0 out of 12 (0%)</td>
<td>6 out of 13 (46%)</td>
</tr>
<tr>
<td>Student 8</td>
<td>3 out of 12 (25%)</td>
<td>10 out of 13 (77%)</td>
</tr>
<tr>
<td>Student 9</td>
<td>5 out of 12 (42%)</td>
<td>10 out of 13 (77%)</td>
</tr>
<tr>
<td>Student 10</td>
<td>2 out of 12 (17%)</td>
<td>6 out of 13 (46%)</td>
</tr>
<tr>
<td>Student 11</td>
<td>1 out of 12 (8%)</td>
<td>11 out of 13 (85%)</td>
</tr>
<tr>
<td>Student 12</td>
<td>3 out of 12 (25%)</td>
<td>12 out of 13 (92%)</td>
</tr>
<tr>
<td>Student 13</td>
<td>3 out of 12 (25%)</td>
<td>12 out of 13 (92%)</td>
</tr>
<tr>
<td>Class Total</td>
<td>24 out of 156 (15%)</td>
<td>120 out of 169 (71%)</td>
</tr>
</tbody>
</table>
Appendix A

Consent Form
CALIFORNIA STATE UNIVERSITY SAN MARCOS
CONSENT TO PARTICIPATE IN RESEARCH

Michelle Carlson is conducting a study on whether or not there are benefits to teaching note-taking strategies to students with disabilities and the effect those strategies have on tests given in an algebra class. You have been asked to participate in this study because you are a member of one of my two algebra classes, which I teach for the Special Education Department at Mt. Carmel High School.

If you agree to participate in this study, you will be asked to do the following:

1) Come to class prepared with textbook, calculator, pencil, and paper.
2) Participate in class lectures.
3) Take notes on the material you are exposed to.
4) Complete the homework that was assigned.
5) Take a pre-test and post-test for the unit.

There are no risks in this experiment greater than those involved in everyday algebra classroom behavior. The benefits to you are that you may discover a new note-taking strategy you can use to help you prepare for taking tests. Your participation will also help me to better understand note-taking strategies and the implication they can have on taking tests.

Participation in this study is voluntary, and you may withdraw from the study at any time without penalty. If you do not participate in this study, your ability to participate in class will not be affected in any way. The experimenter will answer any questions that you have. If you have further questions, please contact myself, Michelle Carlson at 484-1180, or Dr. Jacqueline Thousand, from California State University San Marcos (CSUSM) at jthousan@mailhost1.csusm.edu. Dr. Thousand will be my faculty advisor for this project. This study has been approved by the Cal State San Marcos Institutional Review Board. Questions about your rights as a research participant
should be directed to the Chair of the Board at (760) 750-8820. You will be given a copy of this form to keep for your records.

I agree to participate in this research study. The experimenter has answered any questions I had.

<table>
<thead>
<tr>
<th>Participant's Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant's Signature</td>
<td></td>
</tr>
<tr>
<td>Parent's Name</td>
<td>Date</td>
</tr>
<tr>
<td>Parent's Signature</td>
<td></td>
</tr>
<tr>
<td>Researcher's Signature</td>
<td>Date</td>
</tr>
</tbody>
</table>
Appendix B

Math Interest Inventory
Math Interest Inventory
Date:________

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I enjoyed math prior to this class</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. I enjoy my math class this year</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. I learn best verbally</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I learn best visually</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I always take good notes</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I have learned good note taking techniques prior to this class</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. I know how to study and prepare for math tests</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. I keep my notes organized and can find them when needed</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. I generally attend tutorials for math as needed (on my own free will)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. I bring my supplies for math daily</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix C

Chapter 5 Pre-Test
Chapter 5 Pre-Test

Find the slope of the line that contains each pair of points.

1. (4, 1) and (2, -2)  
2. (4, 12) and (-1, -3)  
3. (7, 7) and (4, 4)

4. (6, 2) and (-8, 1)  
5. (-5, 0) and (-5, 1)  
6. (7, 4) and (-5, 4)

Write whether the lines that contain the pairs of points below are *parallel* or *perpendicular*.

7. (2, 5) and (1, 2); (-1, 7) and (-2, 4)  
8. (-1, 2) and (4, 2); (5, 9) and (-1, 9)

9. (-8, 2) and (5, 1); (6, 5) and (5, -8)  
10. (4, 0) and (1, 5); (3, 7) and (6, 2)

Find the x-intercept, the y-intercept and the slope of each line.

11. \( y = 3x - 3 \)  
12. \( y = -4x \)

The x-intercept of this line is _________.  
The x-intercept of this line is _________.

The y-intercept of this line is _________.  
The y-intercept of this line is _________.

The slope of this line is _________.  
The slope of this line is _________.
Appendix D

Chapter 5:1 Notes
Some equations have \text{________} variables. Variables are \text{________} that take the place of numbers we don’t know. The \text{________}, or answers, to these variables are known as an \text{__________}.

How do you solve for these ordered pairs????
You can use \text{__________}. You can substitute the first number in for the letter, or variable, \text{________}. You can substitute the second number in for the letter, or variable, \text{________}.

Let’s try some:

Is (1, -1) a solution of \text{y = 2x -3}?
Step #1: Put in the ordered pair for x and y.
Step #2: Solve the equation to see if it ends up being balanced.
Step #3: If it is balanced then yes, it is a solution for the equation, if not, then it is not a solution for the equation.

Let’s try another one:

Is (-2, 1) a solution of \text{y = 2x - 3}?

Use the steps above to check.
Appendix E

Chapter 5:2 Notes
When you graph ordered pairs and they create a straight line, it means that the equation is a ______ equation.

In order to graph a **linear equation** you must have how many ordered pairs? ______

How do you find the values for x and y?

Draw an example of a **linear equation** below by graphing these ordered pairs.
(-4,-1), (0,1/3), (5,2).
Appendix F

Chapter 5:3 Notes
Chapter 5:3 Notes
Title of section: ______________________

The _______ is the steepness of a line. It is like running to 7-11 or up hilltop. Which run is easier? That means the slope is _________ as the the other one. Which one has a steeper slope? _______

Y= Rise or run? (Circle the correct answer)
X= Rise or run? (Circle the correct answer)

So if Y=______ and X=_______, what does the fraction look like?

_______

When you find the slope of a line, you put the rise over the run. To find the rise you would __________ the two y values. To find the run you subtract the two _____ values.

y-y=rise
___

x-x=run

Samples:
Describe a vertical line:
The run = __________
What does it look like? (Draw it)

Describe a horizontal line:
The rise = __________
What does it look like? (Draw it)

Find the slope of a line that contains (2, 2) and (2, -1).
Find the rise = __________
Find the run = __________
Make it a fraction
What is the slope?
What type of line is it?
Appendix H

Chapter 5:5 Notes
Look at the pictures at the top of page 126. The picture on the left shows lines that are _____. The picture on the right shows lines that are _____. When lines are parallel, they have the ______ slope. If lines are perpendicular, then their slopes are ________.

Draw a picture below of each type and label them as perpendicular or parallel.

Show the steps in determining each slope as parallel or perpendicular. (-2,-3) (1,3) and (0,-4) (2,0).
1. Find the slope of the first line. What is the equation?
2. Divide rise by run. What is the fraction?
3. Find the slope of the second line. What is the equation?
4. Divide rise by run. What is the fraction?

Show the steps in determining each slope as parallel or perpendicular. (1,-1) (0,2) and (-1,0) (2,1)
5. Find the slope of the first line. What is the equation?
6. Divide rise by run. What is the fraction?
7. Find the slope of the second line. What is the equation?
Divide rise by run. What is the fraction?
Appendix I

Chapter 5:6 Notes
Chapter 5:6 Notes
Title of section: ____________________________

The ____________ is the value of x at the point in which it crosses the x-axis. This happens when y=_____.

The y-intercept is the value of where the line crosses the _________. This happens when x=0.

y = -2x - 4
Can you find the y-intercept without graphing? Y N
Here's how:

y = -2x - 4
Can you find the x-intercept without graphing? Y N
Here's how:

Key points to remember:

You can solve for the x-intercept by plugging in _____ _____ for y.

You can solve for the y-intercept by plugging in 0 for _____.

NO you do not have to graph to find intercepts!
Appendix J

Chapter 5:7 Notes
You can graph a line by having just one point and the __________ of a line!!!!!!!!! First you would want to plot the point you know about. Then start from that point and use the ______________ to find another point, and so on.

Let's try one. Plot this point on a graph below: (1,3) and it has a slope of 2/3.
First move right one time.
From there move up three times. Put a dot there.
Now from that point you would move right twice and three times, put another point.
Repeat as needed and then connect the points.

Now you try one:
Graph (0,3) and a slope of -1/2.

Start at ____________
From there move up/down __ times. Plot a point.
From that point move up/down, because it is negative, __ times and then left/right __ times.
Continue as needed and then ____________ the dots to form a line.
Appendix K

Chapter 5:8 Notes
Chapter 5:8 Notes

Title of section: ________________________________

The slope-intercept form is written so one can clearly and easily identify the _______ and the ________ just by looking at the equation. In the equation below please identify the following:

\[ y = \frac{1}{2}x + 2 \]

Slope:
Y-intercept:
The y-intercept form is: \[ y = mx + b \].

Find the slope and the y-intercept: \[ y = -x - 2 \]

Write the slope-intercept form:
Write the equation:
Find \( m \) and \( b \):
The slope is:
The y-intercept is:

Let's try another one: \[ y = 2x \]
Write the slope-intercept form:
Write the equation:
Find \( m \) and \( b \):
The slope is:
The y-intercept is:

Last one: \[ y = 4 - \frac{x}{2} \]
Write the slope-intercept form:
Write the equation:
Find \( m \) and \( b \):
The slope is:
The y-intercept is:
Main ideas of today's lesson were:
Appendix L

Chapter 5:9 Notes
Linear equations can be written in many ways. The **standard form** is one way. It looks like this:

\[ Ax + By = C \]

Write this equation in y-intercept form:

y-intercept form: \( y = mx + b \) (if this does not look familiar to you it was taught in 5:8):

\[ 4x + 2y = -8 \]

Try another one. Put this equation in y-intercept form:

\[ 3x - 2y = -6 \]

Important facts from this lesson:
Appendix M

Chapter 5 Test
Chapter 5 Test

Tell whether each ordered pair is a solution of the equation. Write yes or no.

1. (-1, -1); \( y = 2 - 3x + 6 = 0 \)
2. (0, 0); \( x = 5y \)
3. (1, -6); \( y \)

Graph each line.

4. \( y = x - 3 \)
5. \( y = -2x + 2 \)
6. \( y = 2x - 3 \)

Find the slope of the line that contains each pair of points.

7. (0, 5) and (-1, -5)
8. (2, -3) and (3, -2)
9. (7, -1) and (-6, -1)

Write whether the lines that contain these pairs of points are parallel, perpendicular, or neither.

10. (6, -2) and (8, -3); (15, 9) and (13, 8)
11. (4, -9) and (5, 5); (6, 5) and (-8, 6)

Solve each problem.

12. Ralph began work at 7 p.m. By 10 p.m. Ralph packed 18 boxes. At the same rate, how many boxes will he pack by 12 midnight?

13. The cost of apples varies directly with the number of bags purchased. Five bags of apples cost $15.00. Find \( k \) in the equation for the cost of apples. Use \( c = kb \).