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A STUDY OF THE EFFECTIVENESS OF PEER TUTORING  
ON MATHEMATICS ACHIEVEMENT OF FIFTH  
GRADE STUDENTS

by  
Kareem J. Thompson

A Thesis

Submitted in partial fulfillment of the requirements of the Master  
of Science in Teaching Degree in the Graduate  
Division of Rowan University  
July 1, 1999

Approved by

Professor

Date Approved

July 1, 1999

## ABSTRACT

Kareem J. Thompson, A Study of the Effectiveness of Peer Tutoring on Mathematics Achievement of Fifth Grade Students, 1999, Dr. Randall Robinson, thesis advisor, Rowan University Master of Science in Teaching Elementary Education

The purpose of this study was to determine the effectiveness of the implementation of a peer tutoring program in mathematics on the academic achievement level of fifth grade students. It was hypothesized that there would be a significant difference in the mathematics achievement level of fifth grade students who participated in a peer tutoring program than in the mathematics achievement level of fifth grade students who do not participate in a peer tutoring program in mathematics.

The study was a quasi-experimental design consisting of students in two fifth grade classrooms. Twenty-three students from each classroom participated in the study. One class was identified as the experimental group and the other class was identified as the control group. Both groups were pre-tested using a unit test created by the authors of Real Math (see appendix A). The experimental group then participated in a peer tutoring program in mathematics for ten weeks. The control group was taught mathematics without supplemental instruction. Both groups were then post tested using a unit test created by the authors of Real Math. A t-test was administered to determine the significance of the mean post test scores for the experimental and control groups where  $\alpha=.05$  (alpha value). The t-test revealed no significant difference between the mean post test scores of the two groups.

## MINI-ABSTRACT

Kareem J. Thompson, A Study of the Effectiveness of Peer Tutoring on Mathematics Achievement of Fifth Grade Students, 1999, Dr. Randall Robinson thesis advisor, Rowan University Master of Science in Teaching Elementary Education

Does the implementation of a peer tutoring program in mathematics effect the academic achievement level of fifth grade students. Forty-six fifth grade students were investigated to determine if participating in a peer tutoring program in mathematics would improve their academic achievement in mathematics. No significant difference was found between those students who participated in a peer tutoring program in mathematics than in students who did not participate in a peer tutoring program in mathematics.

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Chapter I  
Scope of the Study  
Introduction

It is probable that peer and cross age tutoring have been in some measure part of human existence since “hunter-gatherer” times. Tutorial instruction, parents teaching their offspring how to make a fire and to hunt and adolescents instructing younger siblings about edible berries and roots, was probably the first pedagogy among primitive societies (Jenkins and Jenkins 1987). Formal education has a long tradition of children teaching other children. The teacher in the one room school, which characterized our early education system, relied on this technique. As far back as fourteenth century Europe, schoolmasters used their best elder scholars as teachers of the other students (Briggs 1998). The first systematic use of peer tutoring was by Andrew Bell in the late eighteenth century. He used children to tutor other children with the view of educating both the tutors and tutees (Goodland and Hirst 1989).

At one occasion or another nearly everyone has been engaged in tutoring, though the experience may not have been part of an organized tutoring program. It is more likely that it consisted of one person informally instructing or assisting another. This happens almost naturally with children in school settings whether or not they have been instructed to tutor. It is a scenario that is repeated many times each day in schools around the country. When educators can build upon peer tutoring and mold it into an organized process, it becomes a powerful learning tool for all involved (Cotton 1989).

### Statement of the Problem

All students need extra help at one time or another in the educational setting, some need more than others do. Students who have mastered a subject area or students having difficulty themselves in learning a skill or concept have the capacity to be a helpful tutoring resource. The students themselves, however, are seldomly used as tutors within the classroom. Schooling in this country is structured around the traditional belief that knowledge is best transmitted from adult to child in a linear fashion (Damon and Phelps 1989).

For most teachers there simply is not enough time in the day to meet all of their students' instructional and emotional needs. Increasing curriculum demands and minimal instructional resources make it arduous for the most responsive teachers to give their students a high quality education within their classrooms. Many have overlooked one potentially powerful educational resource immediately at their disposal, the children seated in front of them (Topping, Ehly 1998). How is mathematical achievement of fifth grade students effected as a result of the implementation of a peer tutoring program? Does peer tutoring have a positive effect on cognitive as well as problem solving skills of fifth grade students? What is the effectiveness of peer tutoring on mathematics achievement of elementary school students? A positive effect between peer tutoring and achievement may encourage teachers to implement strategies to strengthen peer interaction and cooperative work.

### Statement of Hypothesis

There is a significant difference in the mathematics achievement level of fifth grade students who participate in a peer tutoring program in mathematics than in the mathematics achievement level of fifth grade students who do not participate in a peer tutoring program in mathematics.

## Limitations

There were several limitations in this study that impact the results. One limitation was that the subjects of this study represented one grade level within an elementary setting, within one school district. Therefore, the results would not apply to students in different grades or in different school districts. The researcher was limited to selecting subjects from one grade level which did not allow for study of achievement in mathematics across grade levels.

Another limitation was that the subjects were not randomly chosen. The researcher was unable to obtain a random sample of the fifth grade. Time was a limitation also. The time frame of the peer tutoring program, which lasted ten weeks, prevented the collection of data regarding the long term effects of the treatment. Subjecting students to the experiment was something which needed to span a far greater time period to assess the long term effects of the treatment.

All of the students who participated in the study were Caucasian; therefore there was no ethnic diversity within the results of the study. This study was not representative of all fifth grade students; therefore, the results cannot be generalized to the entire population of fifth grade students.

## Definition of Terms

For the purpose of this study the following definitions were provided:

Peer tutoring- The process by which a competent pupil, with minimal training and with a teacher's guidance, helps another student at the same grade level learn a skill or concept (Thomas 1993).

Tutor- The pupil who gives special or remedial instruction.

Tutee- The pupil who receives special or remedial instruction.

## Chapter II

### Review of Literature

#### Introduction

Peer tutoring comprises students teaching each other, whether they are of like or differing ages, on a one-to-one basis. Peer tutoring is a cooperative process in which students share not only the answers but also the process used to attain the answers. Students identify with each other better than they do with adults. Modeling is a significant part of peer tutoring, teachers may exhibit the cognitive skills of a tutor in a more adept manner, but tutors often evoke a greater effectiveness because students believe they can attain a peer's level of achievement while a teacher's level is unobtainable to them. There is also the fact that tutors can provide immediate feedback of unclear information and lessons not understood (Webb, 1987). The hypothesis of the study was that there will be a significant difference in the mathematics achievement level of fifth grade students who participate in a peer tutoring program in mathematics than in the mathematics achievement level of fifth grade students who do not participate in a peer tutoring program in mathematics. The questions this study sought to answer was whether mathematical achievement of fifth grade students is effected as a result of the implementation of a peer tutoring program and does peer tutoring have a positive effect on cognitive as well as problem solving skills of fifth grade students?

#### History of Peer Tutoring

For many years peer tutoring has been used to facilitate the learning process. The first to use this method of teaching was Quintillion in the first century A.D. In his work

Institution Oratorio he describes a methodology of older children tutoring younger ones.

The writings of Aristotle also depict tutoring as an integral part of the educational framework. The earliest documentation of someone using a peer tutoring approach was Dr. Andrew Bell in the late 1700s. His monitorial system was implemented in a school in Madras, India where it was noted that miscreant behavior decreased and there was an increase in the students' academic progress. Bell also observed that this progress was not limited to the tutees but the tutors also increased knowledge. Joseph Lancaster, a British educator in the late 18<sup>th</sup> century also perceived the relevance of the peer education approach. He established supervised programs where disadvantaged youth taught the primary subjects to their peers (Osguthorpe and Scruggs, 1886).

The use of the Bell-Lancaster system spread throughout Europe. Its success was due in part to students aiding teachers in a time when cost effectiveness was a major consideration and teachers were few in number. In the mid-1800s its use diminished because of the implementation of more professional educators as well as the framework of the school system being changed, trends, which included classrooms that were separated by age groups, and increasing self containment (Sinclair and Goodlad, 1989).

Peer tutoring was used in schools through the 19<sup>th</sup> century, but there was little mention of it until several developments made its use attractive, especially in urbanized areas. The passage of the Elementary and Secondary Education Act of 1965 provided incentives for creating peer tutoring programs, and practices designed to improve the academic performance of student populations such as limited English proficient students and low achieving students. Also, there was a change in learning relations with small

group interactions and teacher methods suited for individual student's needs (Webb, 1987).

### Tutoring Models

Tutoring models are various in terms of strategy and methodology. Two of the more common models are peer tutoring where the individuals are of the same age and cross age tutoring. Peer tutoring is an approach where one student instructs another in subject matter that the tutor is more knowledgeable in than the tutee. The term peer tutoring often assumes both cross and same age tutoring. Cross age tutoring is when an older student who has an excellent grasp on the skills to be taught tutors a younger individual having difficulty in a certain subject area. Pairing for crossed age peer tutoring is most beneficial when there is at least a two-year age difference between tutors and tutees. Younger children have the propensity of seeing older children in a positive light and perceiving them as role models more than they would with a student of their own age. The accomplishments of the older student may be greater and, therefore, they would have attained a higher skill level, which would foster the older student's teaching role. With differentials of less than two years behavioral problems may occur between tutor and tutee (Barone and Taylor, 1996).

The peer research laboratory at the City University of New York designed a cross age tutoring model in which the tutoring process is viewed as developmental. All tutors will have had the experience of being tutees as part of their apprenticeship for becoming tutors. For example, in an elementary school, sixth graders tutor second graders. As second grade students advance a grade they in turn tutor younger schoolmates. Tutees

benefit from the tutor center program in a number of ways: motivation to learn improves through participatory sharing with the tutors, well trained tutors heighten the tutee's learning, and the value of being tutored in preparation for tutoring in the future increases self esteem. In addition, students recognize their importance as educational resources; they are not only receivers, but givers and helpers as well. In essence, receiving tutoring serves more than the goal of learning the lesson (Gartner and Riessman, 1993).

### Effectiveness of Peer Tutoring

Peer tutoring has been implemented in the whole class environment to be an effective way of providing students with a one-to-one instructional setting. One such program took place in a Vermont elementary school's second grade classroom. The program was designed to improve students' speed and accuracy in responding to addition facts both orally and in writing. A partner flash card procedure was used along with the implementation of written speed tests (Greenfield and McNeil, 1897). The children used were twenty-one students attending a homogeneously grouped mathematics class, which met every day for thirty-five minutes. The students were from five second grade classrooms in the school and comprised the low average mathematics class. The students were tutored for three days a week, fifteen minutes per day. The desks were arranged to face each other and a timer was set for fifteen minutes. Students then began the flash card procedure of drilling one another on mathematics facts. Each student had a tutoring folder with which his or her tutoring records were kept. After each three-day session the classroom teacher checked the work. There were happy faces and stickers for reinforcement. If a student received two happy faces in a week, they could choose a



sticker to put up on the tutoring chart posted in the classroom. The speed test was a written test of one hundred facts given in a three-minute time span. These tests were administered three times weekly halfway through the study. It was demonstrated that the peer tutoring significantly increased students' knowledge of mathematics facts, both orally and on written speed tests. All students increased the percentage of addition facts they knew, as measured by the pre and post tutoring tests. All but one student improved their ability to pass the written speed test with increased accuracy (Greenfield and McNeil, 1987).

The use of peer tutors in the classroom enables educators to be more compliant to their students, and aid their efforts toward students' individual needs. Peer tutoring offers an alternative teaching strategy that creates a favorable environment for this objective to be met. It empowers both the tutor and tutee to become more self-directed in their learning. As they participate actively in the learning and evaluation of each activity, both tutor and tutee further develop their abilities to evaluate and analyze their own skill levels and performance (Barone, 1991,1992). Tutors also make it possible for teachers to introduce more learning activities, which normally would not be accommodated within a regular teaching load. By peer tutors taking on the responsibility of remedial instruction and lesson reinforcement, it allows teachers to take on new roles such as facilitator instead of simply being a source of knowledge (Webb, 1987).

### Heterogeneous Grouping

Heterogeneous grouping of students is another area of focus in a peer education approach. Heterogeneous grouping deals with students of varying intellectual abilities

within a whole classroom collaborating efforts to learn a subject matter in cooperation with one another. Heterogeneous groups are effective for students by increasing equity of access and by developing higher order thinking, while promoting social interactions and recognition of contributions (Renzulli, 1994; Cohen, 1994;). Heterogeneous grouping should be used when social interactions and diverse viewpoints contribute to the subject matter (MacIver and Epstein, 1993). All students need interaction with peers, challenging exposure to higher level thinking, recognition of contributions, and equal access to quality instruction. Research of the effects of heterogeneous grouping on low achievers show positive effects on achievement, self esteem, and intergroup relations indicating the addressing of emotional, interpersonal, and intellectual needs (Slavin, 1990). Cooperative group strategies involve the combined achievement of group members. The participants depend upon one another and work together to enhance mathematical achievement. Interdependence is an intervention component that involves a structured format of mutual assistance in which each group member makes a unique contribution to the group's achievement. Collaborative learning interventions that have included structured roles for students to assume specific tasks have produced greater achievement gains than less structured, more ambiguous, cooperative arrangements (Slavin, 1983). The effectiveness of this intervention is believed to be a function of the potency of peer teaching and the added motivational value of team accomplishments. Research has shown that the explanation process and putting children in a position to explain or teach concepts to one another improves the learners' retention of information (Webb, 1985). Some disadvantages to this form of grouping are that the tutee may feel

inadequate academically and a lowering of self-esteem due to this may occur. It is the program implementer who must be cognizant of groupings and whether instruction is qualitative and favorable for both tutor and tutee (Topping, 1998).

### The Benefits of Peer Tutoring

Tutoring programs can be structured so that both tutors and tutees benefit.

According to the research, peer relationships contribute to social and cognitive development and socialization. Learning, friendship and social growth are often positive outcomes. Some specific benefits include: children learn positive attitudes, values and skills through peer modeling. Through peer interaction, children learn to share, to help, to comfort, and to empathize with others. Peer relations have a strong influence on achievement. Peer relations are a powerful influence on a child's development of identity and autonomy (Thomas, 1993).

Peer tutoring may be successful due to many variants. One such variant is the fact that students often speak a more similar language among themselves as opposed to with interactions in which a teacher is present. Damon and Phelps (1989) stated the following:

Unlike adult, in child instruction in peer tutoring the expert party is not very far removed from the novice party in authority or knowledge, nor has the expert party any special claims to instructional competence. Such differences affect the nature of discourse between tutor and tutee, because they place the tutee in a less passive role than does the adult-child instructional relation. Being closer in knowledge and status, the tutee in a peer relation feels freer to express opinions, ask questions, and risk untested solutions. The interaction between instructor and pupil is more balanced and livelier. This is why conversations between peer tutors and their tutees are high in mutuality even though the relationship is not exactly equal in status. (p. 138)

Three theoretical perspectives support the idea of peer teaching. The cognitive approach is the first and its focus is on information processing. Learning is at an

optimum when students organize information, make it meaningful, and therefore, increase connections with it, and apply it to new contexts (Svinicki, 1991, 30). The second view is that of motivational theory, this perspective deals with how learning is initiated and sustained. This method puts the responsibility of learning on the student using innovative methods ( Forsyth and McMillan, 1991,55,63). The final theory is the social context, the kind of environment most conducive to learning is thought to be dialogue, characterized by interaction and cooperation (Rubin and Hebert, 1998).

The benefits of peer tutoring are not limited to the peer teachers but are also inclusive of the student audience as well. Many educators believe that students learn more in a secure, cooperative classroom. Students are more apt to take a greater role in their educational experience in a situation where they are not simply dependent on and subordinate to an authority figure or teacher. By being flexible and innovative with teacher-student roles as well as presentation modes the method can motivate students and spark their interest (Forsyth and McMillan, 1991, 55,63).

#### Assessment

Proponents of peer tutoring suggest that an integral part of program development is student assessment. The needs of the students must be met in order for the program to have success. Ample time must be given to tutor training. Prospective tutors should be thoroughly trained in the program measures so specific tasks and needs can be attained. A peer tutoring program is an extensive process which when implemented will take weeks to occur and appropriate time must be allotted for completion. There are several critical elements to employ to ensure success in a peer-tutoring program. Students must

relate to one another to achieve common goals. Students must be personally accountable for mastering the material and for helping each other. Students also need to understand that it is to their advantage if the other students learn. They must learn to build and maintain collaborative relationships. Groups must be as heterogeneous as possible in academic ability, ethnicity and physical disabilities (Thomas, 1993).

In spite of extensive research on the positive effects of peer tutoring it is not widely in use because of many obstacles: tradition, teacher resistance, possible disadvantages accruing to the tutor, possible tutor impatience, implications of tutor selection, parent cautiousness, implications for school organization and teacher concerns about possible disruptive behavior in tutoring pairs (Kalkowski, 1995). Damon and Phelps (1989) indicated:

Despite popular suspicions about the dangers that peer pressure poses for youth, Scientific studies have left little doubt that peer relations can greatly benefit children's social and intellectual development. The case for children's peer relations has been made repeatedly and conclusively in developmental theory and research. Repeated studies have shown that peer interaction is conducive, perhaps even essential to a host of important early achievements: children's understanding of fairness, their self-esteem, their proclivities toward sharing and kindness, their mastery of symbolic expression, their acquisition of role taking and communication skills, and their development of creative, critical thinking. (p.135)

### Summary

The review of literature contains evidence of peer education approaches facilitating the learning process. One of the better aspects of human nature is our capacity and willingness to help each other. Tutoring takes this and builds upon it, making it not only an instrument for building positive interpersonal relationships, but also an extremely flexible, cost effective learning tool by which children on both sides of the

equation (tutors and tutees) can flourish (Rekrut, 1994). Young people help each other in many ways. Beginning in childhood, as they play together, children learn important lessons such as sharing, communicating, and cooperating. Peer tutoring consists of students teaching other students. It is a cooperative undertaking in which students share not only the answers but also the process used to reach the answers. As a result of their efforts to help others, tutors reinforce their own knowledge and skills, which in turn builds their self-confidence and self esteem. Peer tutors also develop a sense of responsibility as a result of helping students to learn (Webb, 1987). The benefits of peer tutoring are relevant through the literature and provide evidence that tutoring gives students opportunities to practice and improve communication skills and work habits. The review of literature also consists of various tutoring models, and a history of peer tutoring as well as its effectiveness.

## Chapter III

### Design of the Study

#### Introduction

This study was conducted to determine the effectiveness of a peer tutoring program on achievement in mathematics of fifth grade students. The hypothesis of the study was that there is a significant difference in the mathematics achievement level of fifth grade students who participate in a peer tutoring program in mathematics than in the mathematics achievement level of fifth grade students who do not participate in a peer tutoring program in mathematics. The questions this study sought to answer was how the mathematical achievement of fifth grade students was effected as a result of the implementation of a peer tutoring program. Does peer tutoring have a positive effect on cognitive as well as problem solving skills of fifth grade students?

#### Population

Fifth grade students enrolled in a southern New Jersey public elementary school comprised the subjects of the study. The subjects were from middle class backgrounds. The ethnic makeup of all the subjects was Caucasian. Parental involvement was high within the community. Schools played a central function in community activities. The majority of the subjects came from two parent households. The level of achievement of the subjects was also high. The study was comprised of one experimental group, which was pre-tested and post tested after having taken part in a peer tutoring program in mathematics supplementing their regular mathematics lessons. Another group was used as a control group and received no peer tutoring in conjunction with their regular

mathematics lessons. This control group was simply pre-tested and post tested. The skills and concepts taught during the students' regular mathematics lessons included addition, subtraction, multiplication, division as well as decimals and fractions. These were the skills and concepts focused on during the peer tutoring sessions. The number of subjects in the experimental group was twenty-three individuals with about a one to one ratio of males to females. There were twelve males and eleven females. The control group was comprised of twenty-three individuals also with twelve males and eleven females.

#### Design of the Study

A nonequivalent control group design was used for this study. Group A, the experimental group, engaged in a peer tutoring program in mathematics, which supplemented teacher instruction. Group B, the control group, was taught mathematics without supplemental instruction. The students were pre-tested and post tested using a unit test created by the authors of Real Math (see appendix A). Knowledge gain was assessed by this instrument. The researcher used a daily log to record student motivation, progress, teacher and student cooperation, disciplinary needs, approximate time on task, absenteeism and program adjustments (see appendix B).

Prior to implementation of the peer tutoring program the researcher read the students files. This was done to gain information on each student including IQ, classification, and previous academic attainment. Students were then pre-tested.

The subjects were heterogeneously grouped for implementation of peer tutoring. Subjects were paired based on each students file information and teacher



recommendations. Subjects were then introduced to peer tutoring. This introduction included a discussion of the details of the tutoring process. The experimenter trained tutors in four thirty-minute sessions. All tutors were trained at the same time. Modeling of behavior and role playing were an integral part of this training. After the initial training phase the tutoring interaction began with sessions occurring three days a week, fifteen minutes per session. The third and final phase of the study included the post test and analysis of data.

The total time for the study was eleven weeks, scheduled as follows:

Week one: Introduction and pre-test

Weeks two and three: Training period

Weeks four through ten: Implementation of program

Week eleven: Post test and analysis

During the final week of the study the treatment would be discontinued and post test and analysis of data would subsequently begin.

#### Procedure

The following procedure was followed for the implementation of the peer tutoring program. Each student had his or her own folder for the peer tutoring program. These folders contained daily log, academic assessment, explanation, and answer worksheets, as well as the activity worksheets to be completed during each session (see appendix B). Prior to each session students obtained their individual folders and paired with their peer

tutoring partner. The instructor chose partners and these pairings were changed weekly. Tutor and tutee designations and responsibilities were changed BI-weekly.

Each peer tutoring session began with tutors and tutees completing the daily log which included the date of the session, their role during the session, and whether they were the tutor or tutee. The students then took out the activity worksheets to be completed during the session. The tutor and tutee each have different responsibilities. It was the tutor's role to explain the activity to the tutee, and help the tutee work through the first few problems. It was the tutee who then completed the remaining problems on the worksheet. The tutor assisted the tutee with explanations on how to complete the problems with the accompanying explanation worksheet provided within the folder when problems were encountered. When the tutee completed the worksheet the tutor checked the answers with the answer worksheet. The number correct and number of problems completed were then recorded on the assessment worksheet. Students were given five minutes to complete this task. At this point both students had the opportunity to write any comments they had regarding the session itself on the assessment page. This was also a time set aside for the students to discuss the situation with their partner, and list both positive and negative statements on the assessment worksheet.

#### Instrument

The instrument used to assess the effectiveness of the peer tutoring program was a unit test created by the authors of Real Math (see appendix A). The tests reflected the contents of the skill areas that were covered during the peer tutoring sessions. The students were pre-tested and post tested, both tests mirrored each other in their content

and quantity for each skill. All problems mirrored each other in both process and level of difficulty.

#### Statistical Treatment

The experimental and control groups were both taught the same subject matter in mathematics. Both groups were pre-tested and post tested after the allotted time of the study. The results were then compared using an t-test where  $\alpha = .05$  ( alpha value) to determine whether there is a significant difference between the groups.

## Chapter IV

### Analysis of the Findings

#### Introduction

Peer tutoring has been linked to positive effects on academic performance and attitudes toward school benefiting both the tutor and the tutee. Often the gains are sustained long after the tutoring has ended ( Fantuzzo et al. 1989). The purpose of this study was to determine the effectiveness of a peer tutoring program in mathematics on the academic achievement level of fifth grade students. It was hypothesized that there would be a significant difference in the mathematics achievement level of fifth grade students who participated in a peer tutoring program as opposed to fifth grade students who did not participate in a peer tutoring program in mathematics. The questions this study sought to answer were how the mathematical achievement of fifth grade students was effected as a result of the implementation of a peer tutoring program? Does peer tutoring have a positive effect on cognitive as well as problem solving skills of fifth grade students? Data analysis was performed and a t-test was administered to determine significance. Results are reported in the narrative and table form.

#### Results

The scores for the pre-test and post test were tabulated for both the experimental and control group. There were forty-eight items on each test. Scores were tabulated by scoring one point for each correct answer. The individual subject scores for the experimental and control groups are recorded in table 1.

table 1

Pre-test and Post test scores for the Experimental and Control Groups

\*x designates each participant\*

Experimental Group	Pre-test	Post_test	Control Group	Pre-test	Post_test
x1	44	41	x1	41	37
x2	43	40	x2	33	32
x3	23	36	x3	30	31
x4	35	45	x4	46	46
x5	34	29	x5	36	37
x6	41	46	x6	40	42
x7	41	36	x7	33	33
x8	39	40	x8	32	40
x9	43	36	x9	31	40
x10	34	45	x10	32	30
x11	21	14	x11	46	47
x12	35	43	x12	48	44
x13	37	43	x13	22	35
x14	39	31	x14	11	22
x15	46	48	x15	44	44
x16	36	41	x16	42	39
x17	37	39	x17	39	42
x18	41	42	x18	38	45
x19	42	36	x19	40	43
x20	37	42	x20	45	47
x21	37	44	x21	47	47
x22	39	27	x22	44	47
x23	43	43	x23	34	31

The means for the experimental and control groups were as follows: Experimental pre-test group mean was 37.7, post test group mean 38.6. Control group pre-test mean was 37.1, and the post test group mean was 39.2.

A t-test was administered to determine the significance of the mean post test scores for the experimental and control groups. A t-score of -.284 with 22 degrees of freedom was calculated for this study. The absolute value of this t-value .284 falls outside the positive and negative critical value of 2.074. This was not significant at the  $p=.05$  alpha level (see table 2).

table 2

Summary of the t-test

Source of Variation	Mean Post Test Scores	Standard Deviation	t-score	Degrees of Freedom
Experimental Group	38.5652	7.5908	-.284	22
Control Group	39.1739	6.8533		

As is evident in table 2 there is no significant difference in the mean test scores between students who participated in a peer tutoring program in mathematics and those students who did not participate in a peer tutoring program in mathematics. The hypothesis of the study was that there is a significant difference in the mathematics achievement level of fifth grade students who participate in a peer tutoring program in mathematics than in the mathematics achievement level of fifth grade students who do not participate in a peer tutoring program in mathematics. However, the findings of the study are not statistically significant. The raw scores and the t-test score does not support this hypothesis. The research does not provide strong support for the hypothesis.

## Chapter V

### Summary, Conclusions, and Recommendations

#### Introduction

The process of peer tutoring has been investigated from a variety of standpoints. One area in which research has been done is on the effectiveness of peer tutoring. Support of this effectiveness is documented through the Review of Literature. Research has shown evidence that the intervention of peer tutoring is effective in improving student achievement in various areas of subject matter. There has been support for peer tutoring in improving both tutee's and tutor's academic achievements. This study attempted to determine the effectiveness of a peer tutoring program on the academic achievement level of students in mathematics.

#### Summary of the Problem

At various times in the educational setting all students need extra help, some more than others do. Students who have mastered a skill or concept in a subject area have the capacity to be a helpful tutoring resource to those students having difficulty in learning the skills or concepts. The students themselves, however, are very rarely used as tutors within the classroom. The questions this study sought to answer were how the mathematical achievement is effected as a result of the implementation of a peer tutoring program? Does peer tutoring have a positive effect on cognitive as well as problem solving skills of the fifth grade students?

### Summary of the Hypothesis

It was hypothesized that there would be a significant difference in the mathematics achievement level of fifth grade students who participated in a peer tutoring program in mathematics than in the mathematics achievement level of fifth grade students who did not participate in a peer tutoring program in mathematics.

### Summary of the Procedure

For the implementation of the peer tutoring program the following procedure was followed. Folders were given to each student. These folders contained daily log, academic assessment, explanation, and answer worksheets, as well as activity worksheets to be completed during each session (see appendix B). The instructor chose peer tutoring partners and these pairings were changed weekly. Tutor and tutee designations and responsibilities were changed bi-weekly. Each peer tutoring session began with the students completing the daily log worksheet which included the date and their role during the session whether they were the tutor or tutee. Students then took out the activity worksheet to be completed during the session. The tutee then explained the activity to the tutor and helped them work through the first few problems. The tutor then completed the remaining problems of the activity. The tutor assisted with explanations and problem solving difficulties with the accompanying explanation worksheet. When the activity worksheet was completed the number correct and the number of problems completed was recorded on the assessment worksheet. After each session students were given the



opportunity to write any comments they had regarding the session whether they be positive or negative on the assessment page.

### Summary of the Findings

A thorough statistical analysis of the data was performed and a t-test was administered. It was found that there was no significant difference in the mean test scores between students who participated in a peer tutoring program in mathematics as opposed to those students who did not participate in a peer tutoring program in mathematics. The experimental and the control group both increased mean scores from pre-test to post test. The experimental group had a mean pre-test score of 37.7 and a mean post test score of 38.6. The control group had a mean pre-test score of 37.1 and a mean post test score of 39.2. However, the mean post test scores of the experimental and control group were relatively the same and the difference in scores was not significant.

### Conclusions

To examine the effectiveness of a mathematics peer tutoring program on the academic achievement level of fifth grade students the post test scores for the experimental and control group were compared using a t-test. After thorough analysis of the scores it was concluded that the mean post test scores of the experimental and control group were relatively the same and the difference between the scores was not significant at the  $p=.05$  alpha level. The t-test score of  $-.284$  fell outside of the positive and negative critical value of  $2.704$ . Therefore, it can be concluded that the academic achievement level of the fifth grade students in this study was not significantly effected by the implementation of a peer tutoring program in mathematics.

### Implications and Recommendations

I would recommend additional research to explore the relationship between peer tutoring and academic achievement. If there is a strong positive correlation between peer tutoring and academic achievement educators will want to implement strategies to increase its use. The use of peer tutors in the classroom enables educators to be more compliant to their students and aid their efforts toward students' individual needs. It empowers both the tutor and the tutee to become more self directed in their learning. Increasing the role of students in the classroom may increase their interest and involvement in learning.

Future research on peer tutoring should be based on a larger, randomly selected sample. The subjects should also reflect a wide range of ethnic diversity. Furthermore, future studies should be conducted for a longer period of time comparing more than two separate classes at the same grade level. Cross age comparisons should also be made across grade levels to compare differences at different stages of child development.

## References

Barone, M., and Taylor, L. (1996). Peer tutoring with mathematics manipulative: A practical guide. Teaching Children Mathematics, 3 (1), 8 (8).

Cohen, E.G. (1994). Designing Groupwork: Strategies for the Heterogeneous Classroom (2<sup>nd</sup> ed.). New York: Teachers College Press.

Damon, W., and Phelps E. (1989a). Strategic uses of peer learning in children's education. Peer Relationships in Child Development (edited by T.J. Berndt and G.W. Lad). New York: John Wiley and Sons, 135-137.

Damon, W., and Phelps E. (1989b). Critical distinctions among three approaches. In Peer Interaction, Problem Solving, and Cognition: Multidisciplinary Perspectives (edited by N.M. Webb). New York: Pergamon Press, 9-19.

Gartner, A., and Riessman, F. (1993). Peer tutoring: Toward a new model. Eric Digest Washington, D.C: Eric Clearinghouse on Teaching and Teacher Education.

Goodland, S. and Hirst, B. (1989), A guide to learning by teaching. Peer Tutoring New York: Nichols Publishing, page 23.

Greenfield, S.D., and McNeil, M.E. (1987). Improving math performance through a peer tutoring program. Eric Digest. Vermont Eric Clearinghouse.

MacIver, D.J., and Epstein, J.L. (1993). Middle grades research: Not yet mature, yet no longer a child. The Elementary School Journal, 93(5), 521-533.

Renzulli, J.S. (1994-1995). Teachers as talent scouts. Educational Leadership, 52(4), 75-81.

Rubin, L., and Hebert, C. (1998). Model for active learning: Collaborative peer teaching. College Teaching, 46(1), 26(5).

Scruggs, T., and Osguthorpe, R.T. (1986). Tutoring inventions within special education settings: A comparison of cross age and peer tutoring. Psychology in the Schools, 23(2), 187-193.

Thomas, R.L. (1993). Cross age and peer tutoring. ERIC Digest, Bloomington, IN: Eric Clearinghouse on Reading and Communication Skills.

Topping, K., and Ehly, S. (1998). Peer Assisted Learning, Mahwah, N.J. Lawrence Erlbaum Associates Publishers.

Webb, M. (1987). Peer helping relationships in urban schools. ERIC Digest. New York: Eric Clearinghouse on Urban Education.

## APPENDIX A

- |  |  |  |   |
|--|--|--|---|
| 1. $\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$    | 2. $8 \overline{)64}$  | 3. $\begin{array}{r} 72 \\ - 8 \\ \hline \end{array}$            | 4. $\begin{array}{r} 73 \\ + 27 \\ \hline \end{array}$          |
| 5. $\begin{array}{r} 351 \\ - 186 \\ \hline \end{array}$     | 6. $\begin{array}{r} 135 \\ \times 214 \\ \hline \end{array}$    | 7. $\begin{array}{r} 305 \\ - 174 \\ \hline \end{array}$         | 8. $8 \overline{)1533}$   |
| 9. $\begin{array}{r} 8796 \\ + 2419 \\ \hline \end{array}$   | 10. $\begin{array}{r} 5432 \\ \times 1000 \\ \hline \end{array}$ | 11. $\begin{array}{r} 37 \\ \times 16 \\ \hline \end{array}$     | 12. $6 \overline{)420}$   |
| 13. $\begin{array}{r} 70 \\ \times 30 \\ \hline \end{array}$ | 14. $3 \overline{)2100}$   | 15. $\begin{array}{r} 700 \\ \times 80 \\ \hline \end{array}$    | 16. $\begin{array}{r} 800 \\ \times 900 \\ \hline \end{array}$  |
| 17. $7 \overline{)29}$                                       | 18. $\begin{array}{r} 67 \\ \times 11 \\ \hline \end{array}$     | 19. $\begin{array}{r} 906 \\ 498 \\ + 317 \\ \hline \end{array}$ | 20. $\begin{array}{r} 479 \\ 322 \\ + 47 \\ \hline \end{array}$ |

Copy each problem, but write  $>$ ,  $<$ , or  $=$  in place of to make a true statement.

- |            |       |             |         |
|------------|-------|-------------|---------|
| 21. $8.2$  | $7.9$ | 23. $17.0$  | $17.00$ |
| 22. $1.08$ | $1.4$ | 24. $12.33$ | $14.33$ |

In each problem, 2 of the answers are clearly wrong and 1 is correct. Choose the correct answers.

- |                     |         |           |           |
|---------------------|---------|-----------|-----------|
| 25. $53 \times 21$  | a. 1003 | b. 1113   | c. 1231   |
| 26. $679 \times 18$ | a. 7222 | b. 14,222 | c. 12,222 |
| 27. $5968 - 3297$   | a. 271  | b. 2671   | c. 1671   |
| 28. $777 + 1777$    | a. 2554 | b. 8554   | c. 9554   |

Multiply.

- |  |  |  |
|--|--|--|
| 29. $\begin{array}{r} 1.71 \\ \times 23 \\ \hline \end{array}$ | 30. $\begin{array}{r} 3.97 \\ \times .101 \\ \hline \end{array}$ | 31. $\begin{array}{r} 1011 \\ \times 7.89 \\ \hline \end{array}$ |
|--|--|--|

$$\begin{array}{r} 32. \quad 4.38 \\ + 5.94 \\ \hline \end{array} \quad \begin{array}{r} 33. \quad 7.29 \\ - 3.46 \\ \hline \end{array} \quad \begin{array}{r} 34. \quad 6.3 \\ - 2.25 \\ \hline \end{array}$$

Solve for  $n$ .

$$\begin{array}{ll} 35. \quad n = 8.2 + 2.05 & 37. \quad n = 1 - 0.4 \\ 36. \quad n = 10.7 - 3.43 & 38. \quad n = 2.2 + 1.85 \end{array}$$

Multiply or divide. Watch the signs.

$$\begin{array}{ll} 39. \quad 3.8 \times 10 & 42. \quad 73.49 \div 100 \\ 40. \quad 100 \times 6.4 & 43. \quad 0.5 \div 10 \\ 41. \quad 5 \div 100 & 44. \quad 10 \times 0.06 \end{array}$$

45. Glen rides his bike to school. It's 3.2 kilometers to school from his house. How far is it to school and back to his house?
46. A rug is 457 centimeters long and 100 centimeters wide. What is its area?
47. A rug is 457 centimeters long. Another rug is 100 centimeters long. The 2 rugs are placed end to end. How long are they together?
48. Alia has saved \$150.00. She wants to buy a bicycle that costs \$145.00 plus tax. The tax is \$7.25. Has she saved enough money?

## APPENDIX B



### Instructions For Completing Peer Tutoring

#### Academic Assessment

1. Write the date of the peer tutoring session on the academic assessment worksheet under the heading labeled Date.
  
2. Write whether you are the tutor or tutee under the heading Tutor or Tutee.
  
3. Write on the academic assessment worksheet how many mathematics problems were completed during the peer tutoring session. Also write the number of the completed problems that were correct under the heading Number of Problems Completed and Number Correct.

Peer Tutoring  
Academic Assessment

<u>Date</u>	<u>Number of Problems Completed</u>	<u>Number of Problems Correct</u>	<u>Tutor or Tutee</u>
-------------	-------------------------------------	-----------------------------------	-----------------------

### Instructions For Completing Peer Tutoring

#### Daily Log

1. Write the date of the peer tutoring session on the daily log worksheet under the heading labeled Date.
2. Write whether you are the tutor or tutee under the heading Tutor or Tutee.
3. Write at least one full sentence commenting on any problems that may have occurred during the peer tutoring session under the heading Comments.
4. Write at least one full sentence commenting on any good things that may have occurred during the peer tutoring session under the heading Comments.

Peer Tutoring

Daily Log

Date

Comments

Tutor or Tutee

## APPENDIX C

## **PEER TUTORING TRAINING**

### **LESSON PLAN 1**

#### **OBJECTIVE:**

At the end of the lesson students will be able to identify the appropriate manner in which to speak and to listen to their tutoring partner when orally asked. They will do so with 100% accuracy.

#### **INPUT:**

1. Discuss how the tutors and tutees are to address each other during the peer tutoring sessions.
2. Discuss active listening; an approach where the tutor and tutee listen as their partner is speaking whether the conversation pertains to instructional information or a partner asking for help.
3. The tutors and tutees are to respect each other, and always be courteous to their partner.
4. Discuss how questions are to be asked during peer tutoring sessions.

#### **MODELING:**

1. Model the manner in which the partners will speak to one another during the peer sessions through role-play.
2. Model active listening with a partner in an instructional situation as well as in a situation where one partner is helping another with a problem.
3. Model courteous behavior, and will display the proper way to ask a question during a peer tutoring session.

**GUIDED PRACTICE:**

The students role-play as partners in a peer tutoring session.

**CHECKING FOR UNDERSTANDING:**

1. Orally question the students on the manner in which they should address their peer partner during the sessions.
2. Discuss how the students should speak and listen to their partners during peer tutoring.

## **PEER TUTORING TRAINING**

### **LESSON PLAN 2**

#### **OBJECTIVE:**

At the end of the lesson students will be able to give examples of three compliments to give to their peer partner during tutoring sessions. When asked orally they will do so with 100% accuracy.

#### **INPUT:**

1. Discuss various ways in which the students are to compliment their partner during tutoring sessions.
2. Discuss the tutor giving compliments to the tutee on their level of improvement, on how well they solved the problems during a session, and on the manner in which their working.

#### **MODELING:**

1. Model the manner in which each student should compliment one another during tutoring sessions.
2. Model students praising improvement, giving positive feedback on their partners work habits, and compliments on how well they solved problems during a session.

#### **GUIDED PRACTICE:**

The students will role-play and give positive feedback in the form of compliments to a partner with assistance from the teacher as needed.



**CHECKING FOR UNDERSTANDING:**

The students will be orally asked to give three examples of compliments that they can say to their peer partner.

## **PEER TUTORING TRAINING**

### **LESSON PLAN 3**

#### **OBJECTIVE:**

At the end of the lesson students will be able to outline the procedure of a peer tutoring session. When orally asked they will do so with 100% accuracy.

#### **INPUT:**

1. Discuss the procedure of a sample peer tutoring session and what is expected of the tutor and tutee.
2. Discuss how to properly complete the daily log and assessment worksheets
3. Also the teacher will talk about the session itself, explaining the directions and worksheets which the tutors and tutees are to follow and complete.

#### **MODELING:**

1. Demonstrate how tutors and tutees should follow the procedures of a peer tutoring session.
2. Model how to complete the daily log and assessment worksheets.
3. Demonstrate the way tutors and tutees will read through the directions worksheets.
4. Follow its instructions for each lesson, and complete the worksheets.

#### **GUIDED PRACTICE:**

The students will model the procedure for a peer tutoring session with aide from the teacher as needed.

**CHECKING FOR UNDERSTANDING:**

The teacher will have the students orally describe the procedures of a peer tutoring session independently.

## **PEER TUTORING TRAINING**

### **LESSON PLAN 4**

#### **OBJECTIVE:**

At the end of the lesson students will be able to describe the debriefing period. Also they will explain the importance of the time period. When asked orally they will do so with 100% accuracy.

#### **INPUT:**

1. Discuss with the students what the debriefing period is.
2. State the importance of this period of time during the peer tutoring session.
3. Review that the debriefing period is a time when tutors and tutees can give feedback to each other. This is also a time when the supervising teacher can provide specific feedback to the students.

#### **MODELING:**

1. Demonstrate the procedure for the debriefing period for the students with role play and characterizations of tutor and tutee.
2. Model students giving each other feedback during a debriefing period and also show the manner in which the teacher can provide specific feedback to the group in a positive or negative manner.
3. The teacher demonstrates how voice level can be a positive or a negative during a peer tutoring session and address the issue during a debriefing period.

#### **GUIDED PRACTICE:**

The students model the debriefing period with assistance from the instructor.

### **CHECKING FOR UNDERSTANDING**

The students role play the debriefing period with their partners.

## **PEER TUTORING REVIEW**

### **LESSON PLAN 1**

#### **OBJECTIVE:**

At the end of the lesson students will be able to solve multi-digit addition and subtraction problems when given a worksheet they will do so with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to add or subtract multi-digit numbers as depicted in the example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which multi-digit numbers should be added and subtracted on the given worksheet.

#### **GUIDED PRACTICE:**

Have the tutee work through problems 1-3 on the first activity worksheet and problem number 1 on the second worksheet with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have tutees individually work through the remaining problems on the worksheet as time permits until finished.

## **TUTOR\TUTEE INSTRUCTION SHEET**

### **ACTIVITY ONE**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE  
FROM THE TEACHER.**

#### **TUTOR-**

1. Ask your partner to complete problems 1-12 on the first worksheet, and 1-3 on the second worksheet.
2. Explain to your partner that together the two of you will work on problems 1-3 activity worksheet number one and problem number 1 on the second activity worksheet.
3. They are to complete the remaining problems by themselves, but they may ask you for help if they are having difficulty.
4. If you or your partner have difficulty you should look at the explanation worksheet within the packet.

#### **TUTEE-**

1. You are to work on problems 1-12 on the first activity worksheet and problems 1-3 on the second activity worksheet.
2. You will work on problems 1-3 on the first activity worksheet and problem number 1 on the second activity worksheet together with your tutor.
3. You are to work on the remaining problems by yourself, but may ask your tutor for

assistance with any problems giving you difficulty. You should complete at least 6 problems during this session.



Do these problems. Watch the signs.

1. 
$$\begin{array}{r} 435 \\ + 217 \\ \hline \end{array}$$

2. 
$$\begin{array}{r} 755 \\ - 694 \\ \hline \end{array}$$

3. 
$$\begin{array}{r} 804 \\ + 102 \\ \hline \end{array}$$

4. 
$$\begin{array}{r} 705 \\ - 349 \\ \hline \end{array}$$

5. 
$$\begin{array}{r} 212 \\ + 349 \\ \hline \end{array}$$

6. 
$$\begin{array}{r} 825 \\ - 312 \\ \hline \end{array}$$

7. 
$$\begin{array}{r} 212 \\ + 379 \\ \hline \end{array}$$

8. 
$$\begin{array}{r} 208 \\ - 199 \\ \hline \end{array}$$

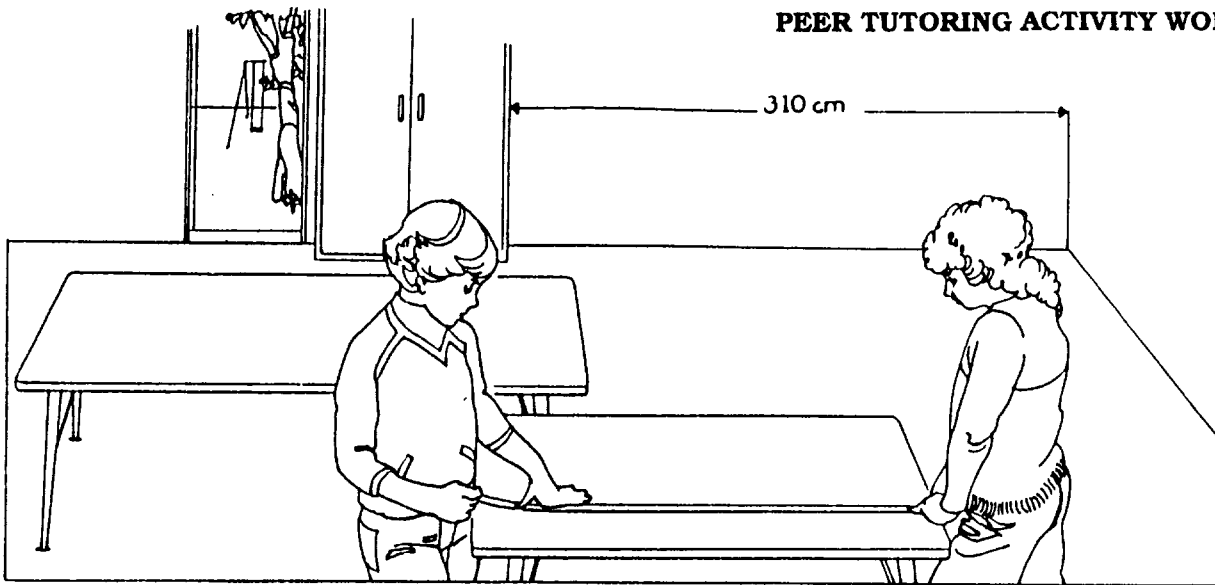
9. 
$$\begin{array}{r} 723 \\ + 239 \\ \hline \end{array}$$

10. 
$$\begin{array}{r} 325 \\ + 184 \\ \hline \end{array}$$

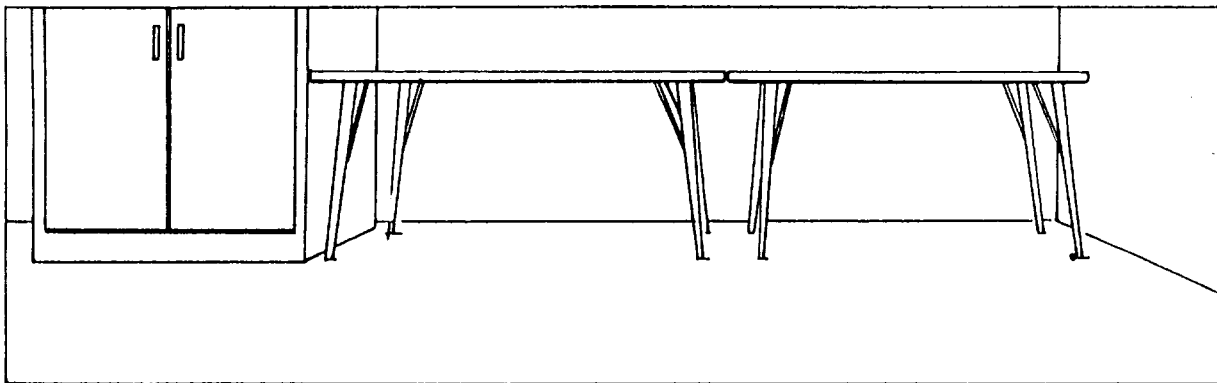
11. 
$$\begin{array}{r} 359 \\ - 260 \\ \hline \end{array}$$

12. 
$$\begin{array}{r} 954 \\ - 675 \\ \hline \end{array}$$

Number correct



One table is 166 centimeters long. The other table is 137 centimeters long. It is 310 centimeters from the cabinet to the wall.



The two tables are put end to end next to the cabinet.

1. How many centimeters long are they together?

\_\_\_\_\_

2. How far is it from the table on the right to the wall?

\_\_\_\_\_

3. Could you squeeze into that space?

\_\_\_\_\_

## Peer Tutoring Explanation Worksheet #1

27

26

+39 The student would add the seven and six and write three in the ones column, and a one at the top of the tens column, they then would continue by adding three plus nine to get twelve, writing the two in the column of the answer space.

27

26

+39

92 The answer should look something like this.

### Peer Tutoring Answer Worksheet #1

- |        |         |
|--------|---------|
| 1. 652 | 7. 591  |
| 2. 61  | 8. 9    |
| 3. 906 | 9. 962  |
| 4. 356 | 10. 509 |
| 5. 561 | 11. 99  |
| 6. 513 | 12. 279 |

### Peer Tutoring Answers Worksheet #1-2

One table is 166 centimeters long. The other table is 137 centimeters long. It is 310 centimeters from the cabinet to the wall.

1. 303 centimeters
2. 7 centimeters
3. no

## **PEER TUTORING REVIEW**

### **LESSON PLAN 2**

#### **OBJECTIVE:**

At the end of the lesson students will be able to solve four-digit subtraction problems when given a worksheet with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to subtract four-digit numbers as shown in example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which four-digit numbers are to be subtracted on the worksheet.

#### **GUIDED PRACTICE:**

Have the tutee complete problems 1,4,6 with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have the tutees individually complete the remaining problems on the worksheet as time permits.

## **TUTOR\TUTEE INSTRUCTION SHEET**

### **ACTIVITY TWO**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE  
FROM THE TEACHER.**

#### **TUTOR-**

1. Ask your partner to complete problems 1-6 on the activity worksheet.
2. Explain to your partner that together the two of you will work on problems 1,4,6 on the activity worksheet.
3. They are to complete the remaining problems by themselves, but they may ask you for help if they are having difficulty.
4. If you or your partner have difficulty you should look at the explanation worksheet within the packet.

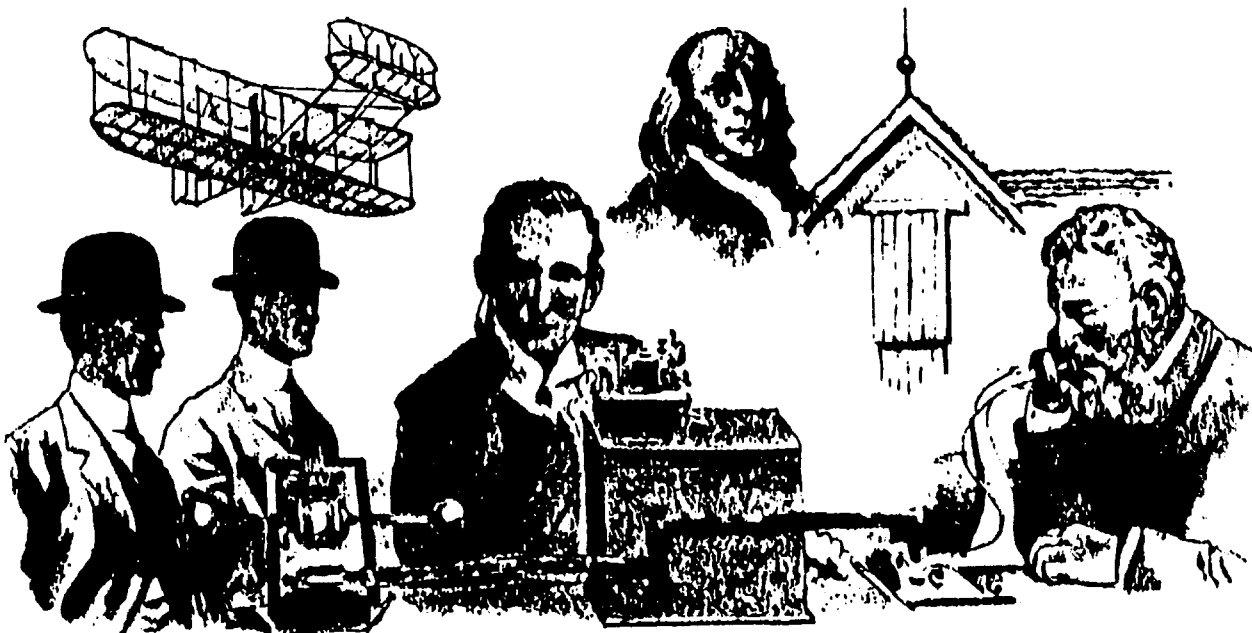
#### **TUTEE-**

1. You are to work on problems 1-6 on the activity worksheet.
2. You will work on problems 1,4,6 on the activity worksheet together with your tutor.
3. You are to work on the remaining problems by yourself, but may ask your tutor for assistance with any problems giving you difficulty. You should complete at least 3 problems during this session.

Complete the table. Show about how many years ago each thing was invented.

	Invention	Inventor	Year Invented	About How Many Years Ago?
1.	Lightning rod	Benjamin Franklin	1752	
2.	Telephone	Alexander Graham Bell	1876	
3.	Radio	Guglielmo Marconi	1895	
4.	Lawn mower	J. A. Burr	1899	
5.	Airplane	Orville and Wilbur Wright	1903	

6. Benjamin Franklin was born in 1706. About how old was he when he invented the lightning rod? \_\_\_\_\_



## Peer Tutoring Explanation Worksheet #2

4192

-3836

First start at the right (ones column) and subtract the six from the two.

You can't subtract six from two so regroup the nine tens to make eight tens and twelve. Now subtract the ones.  $12-6=6$  and in the tens column  $8-3=5$ . Moving to the hundreds column  $10-8=2$ .

4192

-3836

Your answer should look like this.



## Peer Tutoring Answer Worksheet #2

1. 247
2. 123
3. 104
4. 100
5. 96

## **PEER TUTORING REVIEW**

### **LESSON PLAN 3**

#### **OBJECTIVE:**

At the end of the lesson students will be able to solve four-digit subtraction problems when given a worksheet with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to subtract four-digit numbers as shown in example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which four-digit numbers are to be subtracted on the worksheet.

#### **GUIDED PRACTICE:**

Have the tutee complete problems 1,4,6 with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have the tutees individually complete the remaining problems on the worksheet as time permits.

## **TUTOR \TUTEE INSTRUCTION SHEET**

### **ACTIVITY THREE**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE  
FROM THE TEACHER.**

#### **TUTOR-**

1. Ask your partner to complete problems 1-10 on the activity worksheet.
2. Explain to your partner that together the two of you will work on problems 1,4,6 on the activity worksheet.
3. They are to complete the remaining problems by themselves, but they may ask you for help if they are having difficulty.
4. If you or your partner have difficulty you should look at the explanation worksheet within the packet.

#### **TUTEE-**

1. You are to work on problems 1-10 on the activity worksheet.
2. You will work on problems 1,4,6 on the activity worksheet together with your tutor.
3. You are to work on the remaining problems by yourself, but may ask your tutor for assistance with any problems giving you difficulty. You should complete at least 5 problems during this session.

### PEER TUTORING ACTIVITY WORKSHEET #3

Complete the table. Show about how many years ago these famous people were born.

	Name	Year of Birth	Born About This Many Years Ago
1.	Joan of Arc	1412	
2.	Jane Austen	1775	
3.	Geronimo	1829	
4.	Pablo Casals	1876	
5.	Lise Meitner	1878	
6.	Albert Einstein	1879	
7.	Helen Keller	1880	
8.	Tsung-Dao Lee	1926	
9.	Martin Luther King, Jr.	1929	
10.	Barbara Jordan	1936	



### Peer Tutoring Explanation Worksheet #3

4192

-3836

First start at the right (ones column) and subtract the six from the two.

You can't subtract six from two so regroup the nine tens to make eight tens and twelve. Now subtract the ones.  $12-6=6$  and in the tens column  $8-3=5$ . Moving to the hundreds column  $10-8=2$ .

4192

-3836

Your answer should look like this.

### Peer Tutoring Answer Worksheet #3

1. 247
2. 123
3. 104
4. 100
5. 96

## **PEER TUTORING REVIEW**

### **LESSON PLAN 4**

#### **OBJECTIVE:**

At the end of the lesson students will be able to estimate problems with fractions when given a worksheet with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to estimate problems with fractions as shown in example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which problems with fractions are to be estimated on the worksheet.

#### **GUIDED PRACTICE:**

Have the tutee complete problems 1,2 with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have the tutees individually complete the remaining problems on the worksheet as time permits.

## **TUTOR \TUTEE INSTRUCTION SHEET**

### **ACTIVITY FOUR**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE  
FROM THE TEACHER.**

#### **TUTOR-**

1. Ask your partner to complete problems 1-6 on the activity worksheet.
2. Explain to your partner that together the two of you will work on problems 1,2 on the activity worksheet.
3. They are to complete the remaining problems by themselves, but they may ask you for help if they are having difficulty.
4. If you or your partner have difficulty you should look at the explanation worksheet within the packet.

#### **TUTEE-**

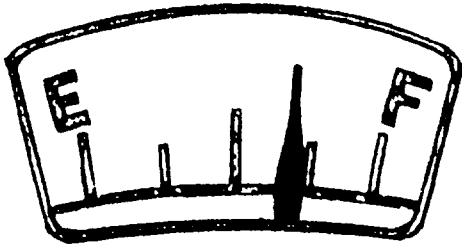
1. You are to work on problems 1-6 on the activity worksheet.
2. You will work on problems 1,2 on the activity worksheet together with your tutor.
3. You are to work on the remaining problems by yourself, but may ask your tutor for assistance with any problems giving you difficulty. You should complete at least 3 problems during this session.



**PEER TUTORING ACTIVITY WORKSHEET #4**

1. About how full is the fuel tank?

- a.  $\frac{1}{2}$  full    b.  $\frac{1}{3}$  full    c.  $\frac{3}{4}$  full



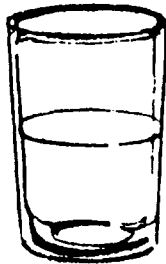
4. About how much of the pie is left?

- a.  $\frac{1}{6}$     b.  $\frac{1}{16}$     c.  $\frac{1}{3}$



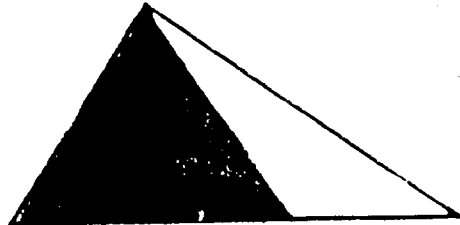
2. About how full is the glass?

- a.  $\frac{1}{4}$  full    b.  $\frac{1}{2}$  full    c.  $\frac{2}{3}$  full



5. About how much of this triangle is colored?

- a.  $\frac{1}{2}$     b.  $\frac{2}{3}$     c.  $\frac{3}{4}$



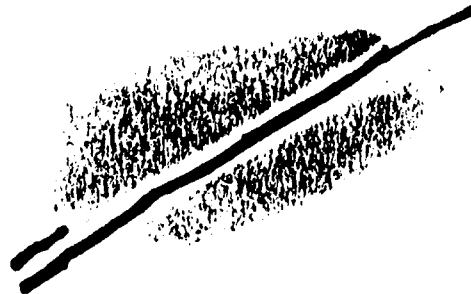
3. About how much of the bookshelf is empty?

- a.  $\frac{1}{8}$     b.  $\frac{1}{3}$     c.  $\frac{1}{2}$



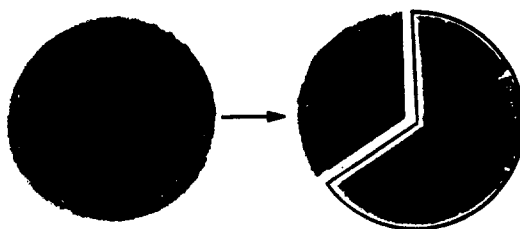
6. The length of the short stick is about what fraction of the length of the long stick?

- a.  $\frac{1}{8}$     b.  $\frac{1}{4}$     c.  $\frac{1}{3}$

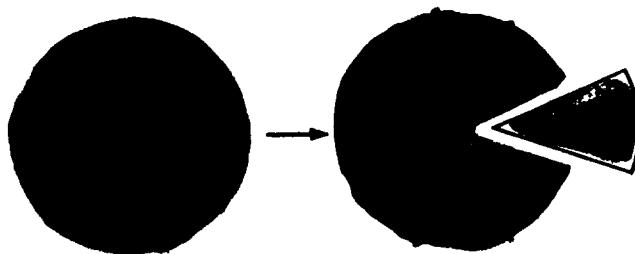




To take  $\frac{2}{3}$  of the board, divide the board into 3 equal parts and take 2 of them.



To take  $\frac{4}{6}$  of the pie, divide the pie into 6 equal parts and take 4 of them.



To take  $\frac{1}{9}$  of the cake, divide the cake into 9 equal parts and take 1 of them.

---

**Remember:** The denominator, or bottom, of a fraction tells how many equal parts there are. The numerator, or top, tells how many of those parts to take.

---

$\frac{2}{3}$  ——— numerator  
           — denominator

**PEER TUTORING EXPLANATION WORKSHEET #4**

Take  $\frac{1}{4}$  of 3 identical sandwiches.

Here are the 3 identical sandwiches.



Let's pile them up.



Divide the 3 sandwiches into 4 equal parts.



Take 1 part. That's  $\frac{1}{4}$  of the 3 sandwiches.



$\frac{1}{4}$  of the 3 sandwiches is the same amount as  $\frac{3}{4}$  of 1 sandwich.

Would you have more to eat if you had  $\frac{1}{4}$  of 3 sandwiches or  $\frac{3}{4}$  of 1 sandwich? You'd have the same amount.

## Peer Tutoring Answer Worksheet #4

1.  $\frac{3}{4}$  full

2.  $\frac{1}{2}$  full

3.  $\frac{1}{3}$

4.  $\frac{1}{6}$

5.  $\frac{2}{3}$

6.  $\frac{1}{8}$

## **PEER TUTORING REVIEW**

### **LESSON PLAN 5**

#### **OBJECTIVE:**

At the end of the lesson students will be able to multiply two and three-digit numbers when given a worksheet with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to multiply two and three-digit numbers as shown in example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which two and three-digit numbers are to be multiplied on the worksheet.

#### **GUIDED PRACTICE:**

Have the tutee complete problems 1,6,11 and 16 with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have the tutees individually complete the remaining problems on the worksheet as time permits.

## **TUTOR \TUTEE INSTRUCTION SHEET**

### **ACTIVITY FIVE**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE FROM THE TEACHER.**

#### **TUTOR-**

1. Ask your partner to complete problems 1-20 on the activity worksheet.
2. Explain to your partner that together the two of you will work on problems 1,6,11,16 on the activity worksheet.
3. They are to complete the remaining problems by themselves, but they may ask you for help if they are having difficulty.
4. If you or your partner have difficulty you should look at the explanation worksheet within the packet.

#### **TUTEE-**

1. You are to work on problems 1-20 on the activity worksheet.
2. You will work on problems 1,6,11,16 on the activity worksheet together with your tutor.
3. You are to work on the remaining problems by yourself, but may ask your tutor for assistance with any problems giving you difficulty. You should complete at least 8 problems during this session.

# PEER TUTORING ACTIVITY WORKSHEET #5

## Remember

$$\begin{array}{r}
 387 \\
 \times 46 \\
 \hline
 2322 \\
 1548 \phantom{0} \\
 \hline
 17802
 \end{array}
 \rightarrow
 \begin{array}{r}
 387 \\
 \times 46 \\
 \hline
 2322 \\
 1548 \phantom{0} \\
 \hline
 17802
 \end{array}
 \rightarrow
 \begin{array}{r}
 387 \\
 \times 46 \\
 \hline
 2322 \\
 1548 \phantom{0} \\
 \hline
 17802
 \end{array}
 \rightarrow
 \begin{array}{r}
 387 \\
 \times 46 \\
 \hline
 2322 \\
 1548 \phantom{0} \\
 \hline
 17802
 \end{array}$$

Multiply. Use shortcuts when you can.

1.  $\begin{array}{r} 247 \\ \times 26 \\ \hline \end{array}$

2.  $\begin{array}{r} 813 \\ \times 59 \\ \hline \end{array}$

3.  $\begin{array}{r} 512 \\ \times 64 \\ \hline \end{array}$

4.  $\begin{array}{r} 256 \\ \times 32 \\ \hline \end{array}$

5.  $\begin{array}{r} 243 \\ \times 27 \\ \hline \end{array}$

6.  $\begin{array}{r} 806 \\ \times 37 \\ \hline \end{array}$

7.  $\begin{array}{r} 281 \\ \times 7 \\ \hline \end{array}$

8.  $\begin{array}{r} 281 \\ \times 70 \\ \hline \end{array}$

9.  $\begin{array}{r} 394 \\ \times 8 \\ \hline \end{array}$

10.  $\begin{array}{r} 394 \\ \times 80 \\ \hline \end{array}$

11.  $\begin{array}{r} 38 \\ \times 27 \\ \hline \end{array}$

12.  $\begin{array}{r} 380 \\ \times 27 \\ \hline \end{array}$

13.  $\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$

14.  $\begin{array}{r} 70 \\ \times 8 \\ \hline \end{array}$

15.  $\begin{array}{r} 700 \\ \times 8 \\ \hline \end{array}$

16.  $\begin{array}{r} 70 \\ \times 80 \\ \hline \end{array}$

17.  $\begin{array}{r} 700 \\ \times 80 \\ \hline \end{array}$

18.  $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$

19.  $\begin{array}{r} 60 \\ \times 70 \\ \hline \end{array}$

20.  $\begin{array}{r} 600 \\ \times 70 \\ \hline \end{array}$

Check to see that your answers make sense.

Multiply:  $49 \times 376$

$$\begin{array}{r} 376 \\ \times 49 \\ \hline 3384 \end{array}$$

Start at the right. Multiply the top number by the **ones** digit.

$$9 \times 376 = 3384$$

Write 3384 so that the digit on the right (4) is in the **ones** column.

$$\begin{array}{r} 376 \\ \times 49 \\ \hline 3384 \\ 1504 \end{array}$$

Multiply by the **tens** digit.

$$4 \times 376 = 1504$$

There are 1504 tens.

Write 1504 so that the digit on the right (4) is in the **tens** column.

$$\begin{array}{r} 376 \\ \times 49 \\ \hline 3384 \\ 1504 \\ \hline 18,424 \end{array}$$

Add to get the final answer.

Check to see that the answer makes sense.

The answer should be less than  $50 \times 400$ , which is 20,000.

The answer should be greater than  $40 \times 300$ , which is 12,000.

18,424 is less than 20,000 and greater than 12,000. So the answer makes sense.



### Peer Tutoring Answer Worksheet #5

- |            |            |
|------------|------------|
| 1. 6422    | 11. 1026   |
| 2. 47,967  | 12. 10,260 |
| 3. 32,768  | 13. 56     |
| 4. 8192    | 14. 560    |
| 5. 6561    | 15. 5600   |
| 6. 29,822  | 16. 5600   |
| 7. 1967    | 17. 56,000 |
| 8. 19,670  | 18. 42     |
| 9. 3152    | 19. 4200   |
| 10. 31,520 | 20. 42,000 |

## **PEER TUTORING REVIEW**

### **LESSON PLAN 6**

#### **OBJECTIVE:**

At the end of the lesson students will be able to multiply two and three-digit numbers when given a worksheet with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to multiply two and three-digit numbers as shown in example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which two and three-digit numbers are to be multiplied on the worksheet.

#### **GUIDED PRACTICE:**

Have the tutee complete problems 1, 2 with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have the tutees individually complete the remaining problems on the worksheet as time permits.

## **TUTOR \TUTEE INSTRUCTION SHEET**

### **ACTIVITY SIX**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE  
FROM THE TEACHER.**

#### **TUTOR-**

1. Ask the student that you are working with to complete problems 1-6 on the activity worksheet.
2. Explain to your partner that together the two of you will work on problems 1,2 on the activity worksheet.
3. They are to complete the remaining problems individually, but they may ask you for assistance if there are any problems in which they are having difficulty.
4. If either of you have further difficulty you should look at the explanation worksheet within the packet.

#### **TUTEE-**

1. You are to work on problems 1-6 on the activity worksheet.
2. You will work on problems 1,2 on the activity worksheet together with your tutor.
3. You are to work on the remaining problems individually, but may ask your tutor for assistance with any problems giving you difficulty. You should complete at

least 4 problems during this session.

### PEER TUTORING ACTIVITY WORKSHEET #6

1. Chuck earns \$5.00 per hour as a short-order cook. He works 27 hours a week. How much does he earn in a week?
2. Elliott's dog Pudgy eats about 275 grams of dog food per day. About how many grams will Pudgy eat in April (30 days)?
3. The chart shows how much time Carlos spends eating each day. Copy and complete the chart. There are 365 days in a year.

Meal	Time Carlos Spends Eating	
	Daily	Yearly
Breakfast	15 minutes	
Lunch	25 minutes	
Dinner	45 minutes	
Total		

4. Marsha has gone to school for 4 years (including kindergarten). She has spent about 180 days in school each year. About how many days has she gone to school?
5. Oleta is 9 years old today.
  - a. Assuming 365 days in a year, how many days old is she?
  - b. If there have been 2 leap years (366 days) since she was born, how many days old is she?
6. Figure out your age in days in this way:
  - a. Find how many days old you were on your last birthday. Don't forget to include leap years.
  - b. Find how many days ago your last birthday was.
  - c. Add to find how many days old you are today.

**PEER TUTORING EXPLANATION WORKSHEET #6**

**Multiply:**  $49 \times 376$

$$\begin{array}{r} 376 \\ \times 49 \\ \hline 3384 \end{array}$$

Start at the right. Multiply the top number by the **ones** digit.

$$9 \times 376 = 3384$$

Write 3384 so that the digit on the right (4) is in the **ones** column.

$$\begin{array}{r} 376 \\ \times 49 \\ \hline 3384 \\ 1504 \end{array}$$

Multiply by the **tens** digit.

$$4 \times 376 = 1504$$

There are 1504 tens.

Write 1504 so that the digit on the right (4) is in the **tens** column.

$$\begin{array}{r} 376 \\ \times 49 \\ \hline 3384 \\ 1504 \\ \hline 18,424 \end{array}$$

Add to get the final answer.

Check to see that the answer makes sense.

The answer should be less than  $50 \times 400$ , which is 20,000.

The answer should be greater than  $40 \times 300$ , which is 12,000.

18,424 is less than 20,000 and greater than 12,000. So the answer makes sense.

### Peer Tutoring Answer Worksheet #6

1. \$135
2. About 8250
3. Breakfast 5,475 minutes, Lunch 9,125 minutes, Dinner 16,425 minutes,  
Total=85 minutes Yearly=31,025
4. About 720
5. A. 3265, B. 328
6. Answers may vary

## **PEER TUTORING REVIEW**

### **LESSON PLAN 7**

#### **OBJECTIVE:**

At the end of the lesson students will be able to divide by a one-digit divisor when given a worksheet with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to divide by a one-digit divisor as shown in example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which to divide by a one-digit divisor on the worksheet.

#### **GUIDED PRACTICE:**

Have the tutee complete problems 4,5, and 7 with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have the tutees individually complete the remaining problems on the worksheet as time permits.



## **TUTOR \TUTEE INSTRUCTION SHEET**

### **ACTIVITY SEVEN**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE FROM THE TEACHER.**

#### **TUTOR-**

1. Ask your partner to complete problems 4-15 on the activity worksheet.
2. Explain to your partner that together the two of you will work on problems 4,5,7 on the activity worksheet.
3. They are to complete the remaining problems by themselves, but they may ask you for help if they are having difficulty.
4. If you or your partner have difficulty you should look at the explanation worksheet within the packet.

#### **TUTEE-**

1. You are to work on problems 4-15 on the activity worksheet.
2. You will work on problems 4,5,7 on the activity worksheet together with your tutor.
3. You are to work on the remaining problems individually, but may ask your tutor for assistance with any problems giving you difficulty. You should complete at least

6 problems during this session.

## PEER TUTORING ACTIVITY WORKSHEET #7

Rosalinda wants to buy a bag of potatoes. A 2-kilogram bag costs 90¢. A 5-kilogram bag costs \$1.50 (150¢).

4. How much do potatoes cost per kilogram in 2-kilogram bags?
5. How much do potatoes cost per kilogram in 5-kilogram bags?
6. Which do you think is the better buy? Why?

Solve.

7. 3 cans of soup cost 75¢. How much is 1 can of soup?
8. 7 pencils cost 91¢. How much is that per pencil?
9. 3 liters of milk cost \$1.23. How much is that per liter?
10. 4 apples cost 52¢. How much is that per apple?
11. 6 oranges cost 72¢. How much is that per orange?
12. A 5-kilogram turkey costs \$7.50 (750¢). A 6-kilogram turkey costs \$9.00 (900¢). Which turkey is the better buy? Why?
13. 3 boxes of tissue cost \$1.38 (138¢). How much is that per box?
14. An 8-bottle carton of soda costs \$1.76 (176¢). How much is that per bottle?
15. A box of 9 doughnuts costs 81¢. How much is that per doughnut?

### Peer Tutoring Explanation Worksheet #7

7/2053 Divide:

How many 7's in 2? 0, How many 7's in 20? 2( write the 2 in the answer above the 0). The remainder is 6. Write the six in front of the 5. How many 7's in 65? 9. How many 7's in 23? 3. The remainder is 2.

$7/2053 = 293$  remainder 2

The answer should look like this.

### Peer Tutoring Answer Worksheet #7

4. 45 cents
5. 30 cents
6. the 5kg bag, you are paying less per kilogram
7. 25 cents
8. 13 cents
9. 41 cents
10. 13 cents
11. 12 cents
12. both cost the same per kilogram, but the bigger one has more meat and  
would be a better buy
13. 46 cents
14. 22 cents
15. 9 cents

## **PEER TUTORING REVIEW**

### **LESSON PLAN 8**

#### **OBJECTIVE:**

At the end of the lesson students will be able to divide by a one digit divisor when given a worksheet with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to divide by a one digit divisor as shown in example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which to divide by a one digit divisor on the worksheet.

#### **GUIDED PRACTICE:**

Have the tutee complete problems 1 and 3 with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have the tutees individually complete the remaining problems on the worksheet as time permits.

## **TUTOR \TUTEE INSTRUCTION SHEET**

### **ACTIVITY EIGHT**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE FROM THE TEACHER.**

#### **TUTOR-**

1. Ask your partner to complete problems 1-10 on the activity worksheet.
2. Explain to your partner that together the two of you will work on problems 1-3 on the activity worksheet.
3. They are to complete the remaining problems individually, but they may ask you for assistance if there are any problems in which they are having difficulty.
4. If either of you have further difficulty you should look at the explanation worksheet within the packet.

#### **TUTEE-**

1. You are to work on problems 1-10 on the activity worksheet.
2. You will work on problems 1-3 on the activity worksheet together with your tutor.
3. You are to work on the remaining problems individually, but may ask your tutor for assistance with any problems giving you difficulty. You should complete at least 5 problems during this session.

**PEER TUTORING ACTIVITY WORKSHEET #8**

1. Mr. Nolan drove 510 kilometers in 6 hours. What was his average speed?
2. Miss Lin drove 250 kilometers in 3 hours. About what was her average speed?
3. Mrs. Vega drove for 7 hours. She drove 90 kilometers the first hour, 85 kilometers the second hour, 50 kilometers the third hour, 50 kilometers the fourth hour, 85 kilometers the fifth hour, 85 kilometers the sixth hour, and 80 kilometers the seventh hour. About what was her average speed?
4. Sita can buy 6 bottles of cola for \$1.44. What is the cost for each bottle of cola?
5. Gregory can buy 8 bottles of cola for \$1.68 (or 168¢). What is the cost for each bottle of cola if he buys it in sets of 8?
6. Janet and her 3 friends wanted to share 36 peaches equally. How many should each child get?
7. Hari bought 9 melons that cost 72¢ each. The tax was 39¢. He gave the storekeeper a \$10 bill. How much change should he get back?
8. Judith bought 9 cans of orange juice. The storekeeper charged her \$5.85 (585¢) for the 9 cans. How much did each can of juice cost?
9. Kimberly and Jonathan left Tinytown at the same time. Kimberly drove 532 kilometers and Jonathan drove 510 kilometers. How far apart were they?
10. Mr. Ortiz drove 530 kilometers one day and 610 kilometers the next. His total trip was to be about 1500 kilometers. About how far did he still have to go?



## Peer Tutoring Explanation Worksheet #8

7/2053 Divide:

How many 7's in 2? 0, How many 7's in 20? 2( write the 2 in the answer above the 0). The remainder is 6. Write the six in front of the 5. How many 7's in 65? 9. How many 7's in 23? 3. The remainder is 2.

$7/2053 = 293$  remainder 2

The answer should look like this.

### Peer Tutoring Answer Worksheet #8

1. 85 km/hr
2. about 83 km/hr
3. 75 km/hr
4. 24 cents
5. 21 cents
6. 9 peaches
7. \$3.13
8. 65 cents
9. can't tell (could be anywhere from 22 to 1042 km apart)
10. 360 km

## **PEER TUTORING REVIEW**

### **LESSON PLAN 9**

#### **OBJECTIVE:**

At the end of the lesson students will be able to solve problems that involve addition and subtraction of decimals when given a worksheet with 80% accuracy.

#### **INPUT:**

Discuss the procedure in which to solve problems that involve addition and subtraction of decimals as shown in example worksheet.

#### **MODELING:**

Have the tutor demonstrate the manner in which to solve problems that involve addition and subtraction of decimals on the worksheet.

#### **GUIDED PRACTICE:**

Have the tutee complete problems 1 and 2 with assistance from the tutor as needed.

#### **CHECKING FOR UNDERSTANDING:**

Have the tutees individually complete the remaining problems on the worksheet as time permits.

## **TUTOR\TUTEE INSTRUCTION SHEET**

### **ACTIVITY NINE**

**ALL WORK IS TO BE DONE IN PENCIL.**

**ALL WORK IS TO BE DONE DIRECTLY ON THE GIVEN WORKSHEET.**

**IF YOU HAVE ANY QUESTIONS, RAISE YOUR HAND FOR ASSISTANCE  
FROM THE TEACHER.**

#### **TUTOR-**

1. Ask the student that you are working with to complete problems 1-5 on the activity worksheet.
2. Explain to your partner that together the two of you will work on problems 1-2 on the activity worksheet.
3. They are to complete the remaining problems individually, but they may ask you for assistance if there are any problems in which they are having difficulty.
4. If either of you have further difficulty you should look at the explanation worksheet within the packet.

#### **TUTEE-**

1. You are to work on problems 1-5 on the activity worksheet.
2. You will work on problems 1-2 on the activity worksheet together with your tutor.
3. You are to work on the remaining problems individually, but may ask your tutor for assistance with any problems giving you difficulty. You should complete at least 3 problems during this session.

# PEER TUTORING ACTIVITY WORKSHEET #9

1. In the 1900 Olympics, Irving Baxter jumped 1.90 meters in the running high jump. In 1968, Dick Fosbury jumped 2.24 meters in the running high jump.
  - a. Which man jumped higher?
  - b. How much higher?
2. In the 1960 Olympics, Wilma Rudolph ran 100 meters in 11.0 seconds. In the same Olympics, 4 American women ran the 400-meter relay in 44.5 seconds. Was the average time for each runner in the relay faster or slower than Wilma Rudolph's time?
3. In the 1896 Olympic games, Thomas Burke ran 100 meters in 12 seconds. In the 1900 Olympic games, F. W. Jarvis ran 100 meters in 10.8 seconds.
  - a. What was the difference in their times?
  - b. Who ran faster?
4. In the 1968 Olympics, James Hines ran 100 meters in 9.9 seconds. By how much time did he beat 10 seconds?
5. In the 1972 Olympics, Valeri Borzov ran 100 meters in 10.14 seconds. If he ran that fast for 200 meters, how long would it have taken him to run 200 meters?

## PEER TUTORING EXPLANATION WORKSHEET #9

Do you remember how to add and subtract amounts of money?

$$\begin{array}{r} \$4.86 \\ + 0.75 \\ \hline \$5.61 \end{array}$$

$$\begin{array}{r} \$15.00 \\ - 9.72 \\ \hline \$ 5.28 \end{array}$$

Line up the decimal points so that you can add or subtract cents and cents, dimes and dimes, dollars and dollars, and so on.

When you add or subtract decimals, line up the decimal points.

**Example:**  $13.71 + 3.45$

$$\begin{array}{r} 13.71 \\ + 3.45 \\ \hline \end{array}$$

Line up the decimal points.

$$\begin{array}{r} 13.71 \\ + 3.45 \\ \hline 17.16 \end{array}$$

Add.

**Example:**  $9.77 - 4.35$

$$\begin{array}{r} 9.77 \\ - 4.35 \\ \hline \end{array}$$

Line up the decimal points.

$$\begin{array}{r} 9.77 \\ - 4.35 \\ \hline 5.42 \end{array}$$

Subtract.

**Example:**  $8.7 - 3.92$

You may occasionally get a problem like this one, in which the number of decimal places is not the same. But this doesn't occur often in real life, since measurements ought to be equally precise.

$$\begin{array}{r} 8.70 \\ - 3.92 \\ \hline \end{array}$$

Line up the decimal points. If it helps, put in a zero (since 8.7 and 8.70 have the same value).

$$\begin{array}{r} 8.70 \\ - 3.92 \\ \hline 4.78 \end{array}$$

Then subtract.

### Peer Tutoring Answer Worksheet #9

1. A. Dick Fosbury, B. 0.34 M
2. Slower
3. A. 1.2 seconds, B. F.W. Jarvis
4. By 0.1 seconds
5. 20.28 seconds

## APPENDIX D



January 25, 1999

Dear Principal,

As a student teacher working with Mrs. Simpson's fifth grade class in the Haviland Avenue Elementary school, you are also aware that I am enrolled as a full time graduate student in Rowan's Master of the Science of Teaching Program. In accordance with that program I am required this semester to conduct the research component of my thesis project. I would like to conduct my research component with the class of my student teaching assignment.

My study is an exploration of the effectiveness of peer tutoring on mathematics achievement of fifth grade students. My proposed research will consist of implementing a peer tutoring program in mathematics to fifth graders. The students will be pretested prior to implementation of the program and posttested upon completion of the program to determine its effectiveness. I will be using Mrs. Jenkinson's class as a control group for the study. I have enclosed a proposed letter of explanation to the parents of the students requesting their permission for their child to participate in the peer tutoring program.

It is important that you realize that the results of this research will be confidential. There will be no identification by name of students, teachers, a school or district.

I appreciate the opportunity that you and your staff have afforded me to learn as a student teacher in your school. If you have any suggestions please contact me. I eagerly await your response on this matter.

Sincerely,

Kareem Thompson

February 8, 1999

Dear Parents.

My name is Kareem Thompson. I have been observing and teaching in the fifth grade since the middle of January as a student teacher.

I am currently in a graduate program at Rowan University which upon completion I will receive a Master's Degree as well as New Jersey State teacher certification. I am required to submit a research thesis for my Master's Degree and to conduct the research during my student teaching experience. My research will consist of implementation of a peer tutoring program in mathematics. The students will be tested before and after the program is completed to determine its effectiveness.

The results will be totally confidential. The names of the students, teachers, school, and district will not be identified in the report of the research. This experience will have no effect upon student's grades nor will it appear in their student records.

Please complete and return the permission slip below to indicate your permission for your child to participate in the study. Thank you in advance for helping me to complete my Master's thesis requirements.

Sincerely,

Kareem Thompson

-----  
\_\_\_\_\_ has my permission to take part in the peer tutoring program in mathematics given by Mr. Thompson. It is my understanding that the results will be confidential and my child's name will not appear in the report of the research.

Child's Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Parent's Signature

## VITA

Name:	Kareem J. Thompson
Date and Place of Birth:	February 15, 1973 Camden, New Jersey
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