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Cooperative learning third grade mathematics activities for LEP students

Jeanne M. Dunaway

COOPERATIVE LEARNING THIRD GRADE MATHEMATICS ACTIVITIES FOR LEP STUDENTS

A Project

Presented to the

Faculty of

California State University,

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In Partial Fulfillment

of the Requirements for the Degree

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in

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Abstract

The advantages of cooperative learning in mathematics instruction for students with Limited English Proficiency are reviewed. Results show a positive correlation between cooperative learning and mathematics instruction.

Sample cooperative learning activities have been developed based on the Addison-Wesley mathematics text for third grade students. These activities have the same lesson focus as the text, but allow students to meet the objective through a "non-traditional" process. The activities include task cards for student use in both English and Spanish. Teachers can reproduce the task cards, maps, tables and recording sheets.

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Elena Clark for reviewing the cooperative learning activities and translating the task cards into Spanish.

Dedication

This project is dedicated to my family, Dennis and Chad, who have given me the time and support I needed to complete this project, expand my professional knowledge, and enrich the lives of my students.

Table of Contents

Introduction

The handbook prepared by the California State Department of Education outlining Individual Learning Programs for LEP students (1984), section 52163 of the Education Code defines the student with limited-English proficient (LEP) skills as one who does "not have the clearly developed English skills of comprehension, speaking, reading, and writing necessary to receive instruction only in English at a level substantially equivalent to students of the same age or grade whose primary language is English". To aid the LEP student in gaining English proficiency, research suggests they be given opportunities to interact with English speaking peers (Milk, 1985)(Wyels, 1990).

While engaging in activities with native English speakers, LEP children improve their understanding of the English language and expand their vocabulary. This exposure influences the type of language acquired, and also the speed with which the language is attained (Cohen, 1986). The language referred to includes social as well as curriculum content area vocabulary. New content terminology that the student is exposed to while actually participating in meaningful and interesting experiences will increase the rate of

acquisition of English language (Reyes & Molner, 1991; Cohen, 1986).

Cooperative learning experiences are seen as an excellent way to integrate English acquisition into content instruction according to the California Department of Education handbook on Individual Learning Programs for LEP students (1984). Cooperative group learning as defined by Cohen (1986) consists of students working in small groups where all group members can participate in a clearly defined task. Slavin (1985) furthers this definition and adds that all cooperative groups are teacher selected, made up of four to six high-, average-, and low-achieving students of mixed gender and diverse ethnicity.

One of the key elements of cooperative learning is the delegation of authority. Students are expected to function without teacher direction. Group members are "free to accomplish their task in the way they think best, but they are accountable to the teacher for the final product" (Cohen, 1986, p. 2). Students within the group are not competing against one another, instead they are given opportunities to lend support and to offer different approaches to the solving of

problems (Slavin, 1990).

LEP students in the classroom from Hispanic or Asian cultures value group work and cooperative interaction according to research from Reyes and Molner (1991). These students respond positively to cooperative learning situations within the classroom. Participation within cooperative groups requires students to communicate at a higher level, and at the same time fosters higher order thinking skills (Reyes and Molner, 1991).

The Mathematics Framework for California Public Schools (1985) also discusses using cooperative learning groups in mathematics instruction. By solving problems cooperatively, it is felt that students will not only gain confidence in their own individual abilities but develop a more positive attitude toward their peers. The authors state that the mathematics program should be structured so that children are encouraged to interact with each other. They further state that "emphasis should be placed on students' talking and listening to each other" (Mathematics Framework, 1985, p. 22). Working on mathematics within small groups, children (both LEP and native English

speakers) have the opportunity to exchange ideas, freely ask questions, explain and clarify (Schwartz, 1991).

Studies comparing whole class instruction to cooperative group learning in mathematics have reported positive results for cooperative groups. Davidson (1991) reviewed over 70 of these studies and found that more than forty percent of them showed significant outscoring by students who participated in the small group method. In two of the studies, children who received whole-group instruction scored higher, but both of these studies had design irregularities. The remaining thirty-nine studies showed no significant difference between the results of whole group and small group instruction. This research suggests that children participating in cooperative group activities will score as well if not better than children receiving traditional whole class instruction.

Knowing that literature suggests cooperative learning strategies are effective in teaching LEP students and also in teaching mathematics, the question is raised as to why current mathematics programs in elementary schools devote little if any time to

instruction for small groups.

This author's assessment of fifty lessons in a third grade state-adopted mathematics text found 47 lessons (94%) outlined whole class instruction followed by individual task assignment with no mention of cooperative or group learning. The State Board of Education is responsible for adopting the texts that are used in California public schools and they realize the importance of group work activities, as evidenced in the State Framework (1985). However, the texts chosen and utilized do not adequately include cooperative learning strategies. If the lessons are to be done in cooperative fashion, the responsibility for adapting the plans belongs to the classroom teacher. The classroom teacher must have knowledge of cooperative group effectiveness to ensure that all students, including LEP children receive adequate and effective mathematics instruction.

The purpose of this project is to investigate the strategies Southern California teachers are currently using in their classrooms to address the diversity of their pupils in regards to language proficiency, specifically in the area of mathematics. Additionally,

a sample format for modifying lesson plans from a California state-adopted mathematics text to include cooperative learning strategies will be developed.

A review of cooperative learning benefits in relationship to mathematics and LEP students follows. Detailed are the strengths of cooperative learning, effective groupings, and various cooperative learning styles. Goals and objectives of the project are then outlined, followed by the procedures for the lesson development and the project results. Finally, related educational implications are discussed.

Literature Review

There is a great deal of current literature discussing the many aspects of cooperative learning. Kagan's (1985) opinion is that the various methods of cooperative learning all have two aspects in common. These include dividing the class up into small teams of students and making these teams positively interdependent because of a task and/or reward structure. Research suggests that creating opportunities for cooperative group experiences to take place in the classroom allows students to attain learning benefits.

Benefits of Cooperative Learning

Cooperative learning helps children meet the intrinsic needs they have to belong to a group (Davidson, 1990). Children want to communicate with others and they need to feel accepted. Placing students within a small group, helps them meet this natural need. Everyone within the group is expected to contribute and is working for the success of the team.

The often times high energy level of the elementary child can be funnelled into active cooperative learning experiences (Davidson, 1990).

Students get to share, do, create, and explore, among other activities in cooperative groups. The physical outlet provided through these group activities builds upon the "learning-by-doing" attitude. The students are involved in their own learning. The cooperative learning method of instruction meets these basic natural requirements of the young child as well as others.

Peer acceptance and teacher approval are also of importance to the student. When children perform well in the classroom they are usually rewarded with teacher approval and good grades, not with success among peers and support of fellow students. This often impacts adversely on peer norms. According to Slavin (1990) this situation could be remedied if students were able to work in teams. The diligent work of the individual would benefit the team. The success of the group would be dependent on each teammate learning, and the responsibility for this learning would belong to fellow teammates. In this situation, students within each group are not competing against one another. Instead they are given opportunities to lend support and to offer different approaches to the solving of problems

(Slavin, 1990). Slavin feels that by utilizing teamwork and cooperation in the classroom, comradery can be built and the fun of learning may be restored.

Yet another reason to implement cooperative groupings is that high-, average-, and low-achieving students are all provided with appropriate learning situations within cooperative learning groups (Cohen, 1986). The teacher can challenge the students' abilities knowing they have resources in their group to draw upon. Beyond the curriculum content skills acquired, cooperative groups provide students with skills that can be transferred to numerous other student and adult work situations. Working cooperatively in schools teaches children to work and live as adults in a cooperative society (Cohen, 1986).

Cooperative Groupings

The actual grouping process is much more involved and intricate than simply deciding which students in the classroom work well together. Each method of cooperative instruction has its own plan as to how students should be grouped. The authors of most plans prefer teacher selected heterogeneous groups (Davidson, 1990). These groups include a range of high to low

achievers, as well as a mixture of boys and girls. Groups should also consist of children randomly selected from diverse ethnicities as well as language proficiencies. There are some methods of cooperative learning that advocate student choice groupings or random groupings. Authors of most of the methods agree that homogeneous groups with all high or all low achievers do not benefit any group (Davidson, 1990).

In any of the cooperative methods, it is important that the situation does not arise where students "work in groups but not as groups" (Bennett & Dunne, 1991, p. 104). Enough structure and explanation must be provided so students are able to work together to accomplish the common goal. Students who work independently as they sit in groups are not going to reap the benefits of cooperative learning.

Results of Cooperative Learning

In considering the benefits of cooperative learning, Slavin (1983) reviewed results from 46 field experiments conducted in elementary and secondary schools. All studied effects of cooperative learning compared to whole group instruction. In 29 of the studies, students involved in the cooperative groups

showed greater achievement than those in the control group. There was no achievement difference in 15 of the studies, and in 2 studies the control group scored significantly higher than did the small group counterpart. These two studies also had design irregularities.

The social benefit of cooperative learning was Slavin's (1983) focus when he reviewed another group of 14 cooperative classroom experiments. The cooperative groups were composed of students from diverse ethnicities. In 11 of the studies, Slavin found there were significantly more cross-ethnic friendship choices than existed for students who did not have the cooperative work experience. Slavin draws the conclusion from this that "high-quality positive interpersonal interaction leads to interpersonal attraction" (1983, p. 430).

In reviewing student opinion in over sixty classes where teachers piloted cooperative strategies, Obler, Arnold, Sigala, and Umbdenstock (1991) found students substantially favoring cooperative groups over traditional lecture format. The students stated that they valued the feedback they received from others of

different cultures. They also felt that they were more involved in the class and would have greater ease applying information learned.

Research from Bennett and Dunne (1991) focused on the quality of talk that occurs during cooperative group work. They were looking for the amount of conversation that actually dealt with the topic at hand, as compared with the off-task discussion. They found that task related talk was generally quite high. In the area of mathematics, 88% of the discussion occurring during cooperative learning activities was task related. They further analyzed and separated the task related talk into three areas: not directly relevant, socially oriented, or cognitively oriented. They found 76% of the talk fell in the last category of cognitively oriented discussion.

Cooperative Learning Methods

While there are many methods outlining cooperative learning strategies, for the purposes of this project, four will be discussed. They are Complex Instruction, Student Teams Achievement Division (STAD), Teams-Games-Tournament (TGT), and the Johnson and Johnson model (1975).

Complex instruction is a very unique learning center approach to cooperative learning in a bilingual classroom. This method was developed by Dr. Elizabeth Cohen and her associates at Stanford University (Davidson, 1990). The role of the teacher changes from the immediate supervisor to one who delegates authority. Within each student group there is a facilitator who is responsible for his/her group's understanding of the directions for the activity. The students "have the right to ask one another for help when they do not understand a step in the task; children who seem to understand have the duty to provide assistance" (Lotan & Benton, 1990, p. 55).

According to Cohen (1986), if the teacher is the direct supervisor of a group activity, students will want to find out what the teacher expects from them and how the teacher thinks they are performing. For the group to function independent of outside influence, the teacher must delegate the authority and not supervise. In addition to a facilitator, each group also has a checker to make sure all work is complete, a cleanup person to supervise that the work area is in order at the end of center time, a reporter who reports on

accomplished work and peer interaction, and a safety officer responsible for necessary precautions. The roles of the students rotate so each child is able to participate in each aspect.

Another cooperative instructional method is Student Teams Achievement Divisions (STAD). After a lesson is presented by the teacher, students work in their teams of four or five to ensure that all members have mastered the lesson. The teams are heterogeneous in regards to gender, ethnicity and ability level (Kagan, 1985). Team members take individual quizzes without assistance on the material presented. Scores are compared to the individual's previous averages and the team is awarded points for meeting or exceeding prior performances. Regardless of what level the student is functioning at, all are able to provide the team with equal points based upon progression past initial teacher identified achievement level. Team recognition is provided in various forms for individual weekly performances or high overall standings. Individuals who perform exceptionally or who have tremendously improved are also recognized. The focus of STAD "is to motivate students to encourage and help

each other master skills presented by the teacher" (Slavin, 1990, p. 71).

Teams-Games-Tournaments (TGT) uses the same mixed ability teams as STAD but replaces the weekly quizzes with tournaments. A bumping system also replaces the individual improvement scores. Students compete against two members from other groups with similar prior performance records. The competitors bring various points to their team, dependent on their performance. As in STAD, both low and high achievers earn equal points for their team. The tournament aspect of TGT adds the element of excitement (Slavin, 1990).

Johnson and Johnson (1975) view a cooperative group structure as one that "requires the coordination of behavior necessary to achieve (the students') mutual goal. If one student achieves a goal, all students with whom the student is linked achieve the goal" (p. 7). Within their cooperative strategy, even more demands are placed on students for interaction and communication skills. The students are given a task to complete and no further directions. They must decide among themselves how to divide the task up in order to

produce a single cohesive product. Students receive a group grade for their efforts (Saphier & Gower, 1987).

Cooperative Learning and Mathematics

Using cooperative learning groups for mathematics instruction promotes success among participating students (Davidson, 1990). The small group design provides opportunities for students to discuss possible solutions and investigate different strategies in problem solving. Group members provide support and help for one another. It is Davidson's view that a student "learns by talking, listening, explaining, and thinking with others" (1990, p. 5).

The authors of the Mathematics Framework for California Public Schools (1985) state that by solving problems cooperatively, students will gain confidence in their own mathematical ability and develop a more positive attitude toward peers. According to the Framework, the mathematics program should be designed to encourage student interaction.

Davidson (1991) reviewed over 70 studies comparing whole class instruction and cooperative group learning in mathematics. He found that in over forty percent of the studies, students who participated in the small

group method outscored those who received whole class instruction. In two of the studies, children who received whole-group instruction scored higher, but both of these studies had design irregularities. The remaining thirty-nine studies showed no significant difference between the results of whole group and small group instruction. For the most part, this research suggests that children participating in cooperative group activities will score as well if not better than children receiving traditional whole class instruction.

Cooperative Learning and LEP Students

Cooperative learning techniques are seen as "excellent ways to promote content and language learning as well as cross-cultural understanding in the heterogeneously grouped classroom" (Bilingual Education Handbook, 1990, p. 45). Within the handbook, the authors cite three strengths of cooperative learning for the LEP child. The first is that the strategy encourages students to naturally adjust their language according to the complexity of the task. Secondly, within cooperative activities, students are able to participate in learning experiences with more regularity than they would be able to in a traditional

classroom setting. Lastly, the classroom philosophy is altered to promote the status of high and low achievers. Mutual interdependence replaces the competitive nature since the success of the group is dependent of the contribution of all.

Research from Reyes and Molner (1991) shows that the cultures of the Hispanic and Asian student value group work and cooperative interaction. The cultural values carry over into cooperative learning activities where each group member has an equal opportunity to learn and an equal obligation to contribute for the overall success of the group. Students from these cultures often respond positively to cooperative learning situations within the classroom. They spend more time on task and consequently receive more practice with new concepts. Students are motivated to learn because of the group rewards and make strong academic gains.

In addition to nurturing cultural values brought by LEP students, cooperative learning is also an appropriate tool to address the language diversity and English acquisition. The handbook developed by the California State Department of Education for the

development of Individual Learning Programs for LEP students (1984) states two functions of language usage in classes with LEP children. One academic function is to teach content curriculum and the other is to advance the acquisition of language or further its development.

In agreement with the California State handbook is the integrative language development approach (ILDA). The focus of ILDA is to integrate second language acquisition while continuing curriculum development (Milk, 1985). To effectively complete this task, Johnson (1983) states the classroom must be appropriately organized to best stimulate second language acquisition. A class that utilizes small group organization where much of the instruction is accomplished through student-student interaction provides such a setting for LEP children (Wong Fillmore, 1982).

Active practice is essential to improving oral communication skills. In Cohen's (1986) view, group activities where students are talking with each other provide much more practice than traditional recitation and drill. In cooperative groups where each member must understand and communicate clearly, the speaker

must be effective in getting his/her point across. Group participation provides more relevant practice than do vocabulary drill exercises. In these situations, students are varying their vocabulary and simultaneously striving to effectively communicate with their team members.

Cooperative Learning with Mathematics for LEP students

LEP children are viewed as having little difficulty in the area of mathematics because of the notion that mathematics is "language free" (Kessler & Others, 1985, p. 3). This misconception does not take into account the vast vocabulary needed and involved in problem solving. Saville-Troike (1984) found that one of the most important aspects of content learning through a second language is knowledge of vocabulary. Misinterpretation is a risk faced by LEP children attempting to solve a problem on their own. When LEP students are immersed in an interactive small group setting, they can acquire both English and mathematics simultaneously (De Avila, 1983).

If students are trained to use group members as resources, everyone can be exposed to challenging complex problem solving and grade appropriate

curriculum. If all group members are not able to read, the ones who can, will read the instructions to them. If the problem given to the group requires multiplication, and only one member knows how to multiply, that member can show the others. A group member who is bilingual may be able to interpret for members who speak only English or only Spanish. By having these resources, the teacher is able to pose more challenging problems to the groups rather than teaching to the ability of the lowest student (Cohen, 1986).

Finding Out/Descubrimiento (FO/D) is an example of a challenging curriculum which utilizes cooperative groups and is designed for Spanish and English speaking students in the areas of mathematics and science (Reyes & Molner, 1991). Heterogeneous groups of students move through a variety of learning centers accomplishing a series of activities belonging to a common theme. Both Spanish and English speaking is encouraged, so children are able to choose the language they feel most comfortable with. Two positive outcomes are noted. First, LEP students "quickly learn the English technical terms and appropriate language for conducting

the activities" and English acquisition "emerges naturally and rapidly through its integration in the content areas because it is learned in the context of solving problems" (Reyes & Molner, 1991, p. 102).

Summary

There is a great deal of current research available discussing cooperative learning strategies. Shown is the obvious effectiveness of cooperative learning groups for language and content acquisition with LEP students. Research has also shown cooperative learning to be a positive tool in mathematics instruction.

While much is known about cooperative learning, there is still limited curriculum available that is designed for this type of instruction. The classroom teachers are responsible for modifying available curriculum and implementing these strategies in their classrooms.

Goals and Objectives

Based upon the review of literature, the goal of this project is to provide sample cooperative learning activities based on lesson objectives found in a third grade mathematics text currently in use. These sample activities are designed for use in groups having mixed gender, ethnicity, English proficiency level, and academic levels. The examples developed may assist educators in enhancing their teaching repertoire and student learning.

Procedures

After reviewing current literature available on cooperative learning for LEP students in the area of mathematics, a survey was conducted in a Southern California school district (see Appendix A). The aim of the survey was to discover if cooperative learning was being utilized for mathematics instruction in classrooms with LEP students.

Survey

The school district of Fontana, California has 612 elementary classroom teachers in 19 elementary schools. 307 surveys were distributed to teachers in 9 of the schools that had the highest concentration of LEP students. Of the 307 distributed, 63 completed surveys were returned. Of those 63 teachers who completed the survey, only 14 of them are bilingual, but 53 of them have Limited English Proficient students in their classes.

Results of surveys showed that 59% of the teachers were using cooperative learning activities with mathematics. Of these, only 41% had groups made up of mixed-gender, -ethnicity, -language proficiency, and -achievement level. The remaining 59% were grouping

for mathematics homogeneously by ethnicity, language, gender, or achievement level, or heterogeneously by language only, gender only, or achievement level only.

Of the total teachers surveyed, only 23% were forming cooperative learning groups for mathematics instruction with consideration to the diversity found in their classroom. This appears to be a relatively low percentage when research supports cooperative learning groups for both mathematics instruction and for teaching LEP children.

While almost all teachers viewed cooperative learning as a useful strategy, many were not implementing it in the content area of mathematics. There appears to be a need to provide classroom teachers with examples of formats for mathematics activities which include cooperative learning. Therefore, this project involved the development of activity cards for use in mathematics which correspond to a state adopted text at the third grade level are provided in this project. These mathematics activities are designed for use with heterogeneously grouped students.

Cooperative Learning Activities

Eighteen sample cooperative learning lessons were developed (Appendix B) based on the Addison-Wesley third grade mathematics text, 1989 edition. The lessons in the text appeared to be divided into four broad areas: measurement, geometry and graphing, computation of whole numbers, and fractions and decimals. Activities were developed for each of these main categories.

Following is a sample of one of the activities developed:

Shopping Mall

Text Lesson Focus: To understand the concept of perimeter and to find perimeters.

Text Activity: Using a centimeter ruler, students find the perimeter of eight shapes on a worksheet.

Cooperative Learning Activity: Students are given two measurements and must figure out either length, width, or perimeter of six figures. They must then decide how to place the figures to resemble stores in a shopping mall.

Activity Task Card:

SHOPPING MALL

Your group needs to fit 6 stores into an empty shopping mall. Some information about the size of each store has been given. You need to give the mall and each store a name. Remember to include the scale your group used to draw the mall.

Your group is responsible for completing the recorder's sheet and drawing the mall.

In this example, the lesson focus of the cooperative learning activity remained the same as in the text. The suggested text activity is stated, as well as the cooperative learning activity. Teachers can see what was suggested and another way they might meet the lesson objective. A list of materials and an activity task card in both English and Spanish are also provided.

Results

The cooperative learning activities developed in this project were reviewed and critiqued (Appendix C) by professional educators who were currently teaching third grade, or who had third grade teaching experience.

The overall reaction was very positive. All teachers commented on the real life relevance of the activities. They felt that the activities showed their students mathematics applications appropriate to their daily lives. The reviewing teachers also felt the hands on experiences would be valuable for their students, as well as the cooperative learning/working experience.

The reviewers felt the activity instructions to teachers were clear and closely correlated to the Addison-Wesley mathematics text. They felt the supplies necessary were either already in their classroom or easily attainable.

Specific suggestions were made for several of the original activities in Appendix B and will be discussed here under the activity title.

Backyard Swing: Three of the reviewers felt this

activity was too abstract for third graders. They felt perhaps a map or drawing of the backyard might be given to the group before work begins. With the dimensions of the yard already known, the students would have an easier time deciding the swing dimensions.

Grocery Store: One teacher suggested listing items a third grader might actually purchase. These might include balls, toys, games or candy.

Perimeter and Area: Two teachers felt the shapes in this activity should be limited to those with right angles only. If students start using diagonal lines, the measurement of perimeter could become confusing.

Hands: One reviewer felt a diagram should accompany this activity showing the way to measure with hands. They thought students could misunderstand and measure thumb to pinky, instead of finger tips to palm.

Angles: One teacher thought it would be helpful if the teacher showed a diagram of an angle finder at the beginning of the activity.

Tall Towers: Two reviewers suggested giving students a list of names of possible buildings. This would give the students a foundation from which to research.

Dice Roll: A suggestion was made to vary the number of dice thrown out each time so the denominator does not remain constant.

Background information is necessary for any of these activities to be successful. For example, National Park might need more explanation for an inner city class of students.

No other specific suggestions were given for the remaining 11 activities, however teachers should feel free to modify and alter any of the activities developed in this project for use in their classroom.

Implications for Education

The activities developed for this project are based on a specific mathematics program for third grade. While the cooperative learning lessons are grade level specific, they are meant to serve as a model to show any teacher how text lessons can be adapted to include cooperative learning activities. The developed lessons may also be appropriate for a wider range of grade levels depending on the student ability levels within individual classrooms.

Research suggests cooperative learning is an effective strategy when teaching mathematics to diverse populations, although current texts include very few activities designed for cooperative grouping. Teachers who know the interests of their students can, as this project models, develop cooperative activities that will involve their students in group learning.

Every lesson taught in the classroom does not need to be taught through cooperative groups, but it does appear to be a successful strategy which varies from traditional instruction. Teachers can develop cooperative group activities using their own objectives based on the state framework, or they can adapt the

text lesson. Various strategies can be used to achieve one particular goal, and at the same time those strategies may more readily fulfill students' needs.

Teacher made task cards related to cooperative learning activities can be translated into different languages spoken by students. The classroom teachers do not need to do the translating on their own, but enlist a person willing and able to assist. Parents, school personnel, or community members who are bilingual might be considered resource persons for this activity. Teachers might decide to collaborate and jointly develop cooperative group activities to be shared with all teachers on that level. Working as a group, teachers can review and refine activities. Lessons could be piloted and the successes and modifications shared, so all have the benefit of a fellow teacher's experience.

Teachers might design some cooperative activities to encourage interaction between English speaking children and LEP students. Grouping students with a wide range of English language proficiency and allowing all access to their language of fluency aids in demonstrating the value all students can offer. Task

cards can be translated so all students understand the task, and bilingual persons can assist when communication between students becomes too challenging.

In all classroom displays and visual print, including those used in cooperative learning activities, mixed gender and people of color should be shown. Teachers should analyze their instructional resources including bulletin boards, posters, manipulatives, and literature and make necessary changes to include diversity.

Finally, as with any curriculum development, teachers need to be knowledgeable of their content and pedagogical strategies. They might gain this knowledge through in-service, coursework, or readings. Knowledge of cooperative learning is necessary if teacher designed activities are to be successful.

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Appendix A

Survey

May 11, 1992

Dear Teachers:

I am currently working on my M.A. project at California State University, San Bernardino, and I need to collect some data for my research. I am interested in developing strategies for classroom teachers to effectively work with Limited English Proficient children in their classes. To do this, it would be helpful to know the strategies teachers are currently using to address the diversity of LEP students.

Please return the survey to your school secretary by Monday, May 18.

Thank you for your cooperation. If you have any questions, please call me at the number listed below.

Jeanne Dunaway

(619) 252-8222

Grade_____

1. Are you bilingual? yes _____ no _____

2. How many students are presently in your classroom?_____

3. How many Limited English Proficient students do you have? _____

4. List any helpful strategies you utilize in helping LEP students learn.*

5. Do you use cooperative learning in your classroom?
_____Yes _____No

6. List the types of activities you do where children work cooperatively.*

7. How do you group your students for cooperative groups?

homogeneously by: language _____
gender _____ mark all
ability _____ that apply

heterogeneously by: language _____
ability _____
gender _____
every way _____

student choice _____ other_____
(please explain)*

8. With which subjects do you most often use cooperative learning?

science _____ social studies_____
mathematics _____ language arts_____
reading _____ other(name)_____

9. What is your definition of cooperative learning? *

10. List any helpful resources you use for LEP students.*

11. Would you be willing to review materials adapted from texts currently in use which address the diversity within the classroom?
_____yes _____(phone #) _____no

_____(name)

please continue any answers on the back if needed

Appendix B

Cooperative Learning Activities

Cooperative Learning Activities

Cooperative Learning Activities

The following lessons were designed for use by groups of four or five heterogeneously grouped children. Student roles should be assigned by the teacher. The teacher will have previously taught the responsibilities and functions of each role. Each group member should be responsible for a task within the group. Possible tasks assigned would include:

Recorder: records process, fills in information sheet with information from group

Facilitator: makes sure all members understand the group's task and individual roles

Clean-up: ensures work area is neat and materials are returned to their proper place at the end of the work period

Safety: makes sure safety measures are observed during the activity

Checker: assures that group has completed all requirements of the assignment

Teachers may amend or change tasks depending on their need.

The project's cooperative learning activities are based on lessons in a 1989 edition of a third grade

mathematics text by Addison-Wesley (Eichol, O'Daffer, Fleenor, Charles, Young & Barnett, 1989). The page number of the text lesson is listed in the lesson focus section of each activity.

Lesson objectives can be developed and taught through a variety of ways. The original focus or objective remains in tact, but the means of achieving that goal vary considerably. Cooperative learning is a strategy that allows for greater student interaction and learning. The group members have a shared experience and have shared responsibility for accomplishing their goal. The group reports to and discusses with the class what they did, how they worked together, and their results. Other groups can compare what they did that was the same or different.

Teachers who have received in-service, or completed course work in the area of cooperative learning strategies should be able to implement these activities in their classroom. For those without prior training in the area of cooperative learning, some helpful resources are listed at the end of Appendix B.

School Map

Text Lesson Focus: To choose appropriate units of measurement. (Addison-Wesley, p. 134)

Text Activity: Using a meter stick, students choose the appropriate unit of measurement, either millimeter, centimeter or meter, to complete 10 questions.

Cooperative Learning Activity: Using metric measurement tools, the group creates a scale model of the top of their teacher's desk.

Materials: butcher paper, construction paper, graph paper, meter stick, ruler, measuring tape, scissors, tape, glue, crayons, colored pencils, markers, pencils, sheet for recorder, etc.,

Activity Task Card:

SCHOOL MAP

Your group is going to create a scale map of top of your teacher's desk. The map must be neat and readable. It must have a compass rose and the scale should be clear. The map must be labeled and named.

Your group is responsible for completing the mapping worksheet in addition to the map itself.

Ficha de Actividad:

Mapa De La Escuela

Su grupo va a dibujar un mapa a escala de la superficie del escritorio de su maestra. El mapa debe estar limpio y legible. Debe tener una brujula rosal y la escala debe estar claramente indicada. El mapa debe tener etiquetas y un nombre/titulo.

Su grupo tiene la responsabilidad de terminar el papel de mapear tambien.

School Map

Group Members: _____ _____

_____ _____ _____

1. What materials do we want to use to make the map? (butcher paper, construction paper, markers...)

2. What are we going to do first, next, and then?

3. Who is going to do what?

4. What scale should we use?

Backyard Swing

Text Lesson Focus: To estimate length using inches, feet, yards and miles.

Text Activity: Students choose between two answers to solve 20 questions. The questions cover height, length, distance, and width.

Cooperative Learning Activity: Students plan the construction of a backyard swing. They must decide what materials they require and the amounts. They must also decide what the backyard physically looks like in order to support their plans. Follow up with opportunity to check estimated measurements on the playground. Discuss with students how realistic their estimations were.

Materials: paper, measuring instruments, sheet for recorder,

Activity Task Card:

BACKYARD SWING

Your group is going to build a swing in a friend's backyard. You will need to decide what materials are needed.

Record the decisions of your group on the backyard swing worksheet.

Ficha de Actividad:

El Columpio

Su grupo va a construir un columpio en el patio de un amigo. Tienen que decidir cuales son los materiales que van a necesitar. Apunte lo que el grupo decidio en el papel del columpio.

Backyard Swing

Group Members: _____ _____

_____ _____ _____

1. What information would be helpful for your group to know?

2. What does our friend's backyard look like? (shape: length, width, trees...)

3. What type of swing did the group decide to build?

4. What tools or materials are necessary? (Include amounts)

5. How did the group decide on the amount of materials needed?

Shopping Mall

Text Lesson Focus: To understand the concept of perimeter and to find perimeters.

Text Activity: Using a centimeter ruler, students find the perimeter of eight shapes on a worksheet.

Cooperative Learning Activity: Students are given two measurements and must figure out either length, width, or perimeter of six figures. They must then decide how to place the figures to resemble stores in a shopping mall.

Materials: graph paper, sheet for recorder,

Activity Task Card:

SHOPPING MALL

Your group needs to fit 6 stores into an empty shopping mall. Some information about the size of each store has been given. You need to give the mall and each store a name. Remember to include the scale your group used to draw the mall.

Your group is responsible for completing the recorder's sheet and drawing the mall.

Ficha de Actividad:

Centro Comercial

Su grupo tiene que colocar 6 tiendas en un centro comercial que está vacio. Tienen un poco de información sobre el tamaño de cada tienda. Necesitan nombrar al centro y a cada tienda. No olvide apuntar la escala que ustedes usaron para dibujar al centro.

Su grupo tiene la responsabilidad de completar la hoja del apuntador/marcador y de dibujar al centro.

Shopping Mall

Group Members: _____ _____

_____ _____ _____

Perimeter (p), length (l), and width (w) information:

l. of store #1: 84 meters
w. of store #1: 30 meters
w. of store #2: 24 meters
p. of store #2: 120 meters
l. of store #3: 60 meters
p. of store #3: 168 meters
l. of store #4: 30 meters
p. of store #4: 108 meters
l. of store #5: 42 meters
p. of store #5: 144 meters
w. of store #6: 60 meters
p. of store #6: 228 meters

Store #	l	w	p

SHOPPING MALL

Group Members: _____ _____

_____ _____ _____

1. Who drew each store?

2. How did our group decide where to place the stores in the mall?

3. How did our group decide the names of each store?

4. How did our group decide on the name of the mall?

Perimeter and Area

Text Lesson Focus: To find area by counting square units.

Text Activity: Students count squares to find the area of several shapes printed in the text.

Cooperative Learning Activity: Students draw two shapes, figure the area and perimeter of two others, and check a team member's solving of two other figures.

Materials: graph paper with name spaces, sheet for recorder

Activity Task Card:

Perimeter and Area

Each member of the group is responsible for drawing two figures on their own piece of graph paper. Each person may make their figure whatever size they wish. A second member will figure out the area and perimeter. A third member will check to see if the answers are correct. If the checker finds a mistake, he/she will return it to the solver for correction.

Your group should put the completed recorder's sheet with the drawn figures.

Ficha de Actividad:

Perímetro Y Área

Cada miembro del grupo tiene la responsabilidad de dibujar dos figuras en su propia hoja de papel gráfico. Cada persona puede dibujar las figuras del tamaño que quiera. Otro miembro figura el perímetro y el área. El tercer miembro verifica que las respuestas estan bien. Si el que chequea encuentra un error, el/ella lo devuelve al que figuró la respuesta para correjirlo.

Su grupo debe poner la hoja de los apuntes junto con las hojas de las figuras dibujadas.

Perimeter and Area

Group Members: _____ _____

_____ _____ _____

1. Complete:

drawn by	solved by	checked by

2. Did any checker find incorrect answers?

3. Which group member drew the figure with the largest area?

4. Which group member drew the figure with the smallest perimeter?

Angles

Text Lesson Focus: To identify angles and right angles.

Text Activity: Students make angle finders and find angles independently in the classroom and record them on their personal chart.

Cooperative Learning Activity: Students make angle finders. Partners within the group find their angles together in the classroom. One measures while the partner records. All information is transferred to a group record.

Materials: Cardboard strips and fasteners, sheet for recorder,

Activity Task Card:

ANGLES

Each group member will create an angle finder by attaching two strips of cardboard with a fastener. Working with a partner, each member will find at least three places in the classroom that have angles. Their partner will record what type of angle each object has. All angles will be compiled into one list.

The group is responsible for a completed recorder's sheet.

Ficha de Actividad:

Ángulos

Cada miembro del grupo va a crear un aparato para encontrar ángulos. Se hace uniendo dos tiras de cartón con un sujetador de papel. Cada miembro trabaja con un compañero y encuentra por lo menos tres cosas en el salón que tienen ángulos. El compañero apunta que tipo de ángulo se encuentra en ese objeto. Apunten todos los ángulos que encontraron en una lista.

El grupo tiene la responsabilidad de completar la hoja de apuntes.

ANGLES

Group Members: _____ _____

_____ _____ _____

 right angles	 smaller angles than right angles	 angles larger than right angles

Angles

Group Members: _____ _____

_____ _____ _____

1. What was the largest angle found by the group?

2. What was the smallest angle the group found?

3. Which column has the longest list? Why do you think that happened?

4. How did all members contribute to the group?

5. Did all members check the list?

Hands

Text Lesson Focus: To make and interpret bar graphs.

Text Activity: Students answer four questions about a bar graph picture and make a their own graph using information from 20 voting ballots.

Cooperative Learning Activity: Using their hand as a unit of measurement, each student measures two distances in the classroom. All measurements are put onto a group graph. The bar graph will be interpreted during whole class discussion after the activity.

Materials: Students' hands, rulers, sheet for recorder,

Activity Task Card:

HANDS

Your group is going to make a graph showing the distance across different objects in the room. Each group member will suggest one thing to measure, and they will measure two things. Your measurements will be in hand units. One hand unit is the length of your hand.

Your group is responsible for completing the graph and the recorder's sheet.

Ficha de Actividad:

Manos

Su grupo va hacer una gráfica que enseña/muestra la distancia entre varios objetos en el salón. Cada miembro va a sugerir un objeto para medir y luego escoje otro, midiendo dos objetos en total. La medida que usan va ser en enidades de mano. Una unidad de mano es lo largo de la mano.

Su grupo tiene la responsabilidad de completar la gráfica y la hoja de apuntes.

Hands

Group Members: _____ _____

_____ _____ _____

1. Complete:

Name	Suggested	Measured

2. Is it easier to find out who measured the longest distance by looking at the chart above, or at the graph? Why?

3. Who suggested the most unique thing to measure?

4. If everyone in the group measured the same item, would everyone get the same number of hand units? Why?

Tall Towers

Text Lesson Focus: To make and interpret bar graphs.

Text Activity: Students answer four questions about a bar graph and make a graph using information from 20 ballots.

Cooperative Learning Activity: Students research information about tall buildings in the world and graph them according to their size and date of completed construction.

Materials: Reference books, graph paper,

Activity Task Card:

Tall Towers

The Empire State Building in New York City is one of the tallest buildings in the world. Your group is going to find out information about the Empire State Building and other tall towers.

Your group is responsible for graphing six tall buildings on graph paper. Include the Empire State Building and other buildings you can find out about that are taller or almost as tall as it. Include the scale for your graph. You will also make a second graph showing dates of construction.

Ficha de Actividad:

Torres Altas

El Edificio Empire State de la ciudad de Nueva York es uno de los edificios mas altos del mundo. Su grupo va encontrar información sobre el Edificio Empire State y otros edificios altos que se llaman rascacielos.

Su grupo tiene la responsabilidad de hacer una gráfica de seis edificios altos en el papel gráfico. Incluyan el Edificio Empire State y otros edificios que puedan encontrar que tienen casi la misma altura o que son mas altas. Apunten la escala que usaron para la gráfica. Tambien hagan otra gráfica que muestra las fechas de construcción de los seis edificios.

Tall Towers

Group Members: _____ _____

_____ _____ _____

1. What were the six buildings your group selected to graph?

2. How did your group decide on these buildings?

3. Where did you find out information about them? (Include publisher, page number, title and author)

4. How did each person in your group participate to complete this project?

Shape Creation

Text Lesson Focus: To explore geometric shapes.

Text Activity: Students work individually using straw pieces and pipe cleaners to create geometric shape figures.

Cooperative Learning Activity: Each group member will create a geometric shape using straw pieces and pipe cleaners. Members will share their creation with the group and discuss its construction.

Materials: Pipe cleaners, straws, scissors,

Activity Task Card:

Shape Creation

Each member of your group is going create a geometric figure using straws and pipe cleaners. The straws can be cut into whatever lengths you want to use.

Each member is responsible for producing at least one figure. The recorder's sheet must also be completed.

Ficha de Actividad:

Creacion Geométrica

Cada miembro del grupo va a crear/hacer una figura geométrica usando popotes y limpiadores de pipas. Se pueden cortar los popotes a cualquier tamaño que quiera. Cada uno tiene la responsabilidad de terminar por lo menos una figura. El papel de apuntes se debe completar tambien.

Shape Creation

Group Members: _____ _____

_____ _____ _____

1. Complete:

Name	Created Figure	Created Figure

2. How did members in the group decide what shape to make?

Favorite Foods

Text Lesson Focus: To make and interpret bar graphs.

Text Activity: Students make a graph from the 20 ballots pictured in the text.

Cooperative Learning Activity: Students survey classmates to find out what their favorite foods are. The group makes a pictograph to show the preference of the group. During discussion time with the teacher and class, the pictograph will be transferred into a bar graph.

Materials: Butcher Paper, construction paper, markers, crayons, pencils,

Activity Task Card:

Favorite Foods

Within your group, you are going to select five food items that you think are the most popular foods with your classmates. Each member will be responsible for making a picture of one of the favorite foods your group decides on. A pictograph will then be made, and during reporting time the information from the entire class will be used to make a bar graph.

Ficha de Actividad:

Comidas Favoritas

En el grupo, ustedes van a escojer cinco comidas que ustedes creen son las comidas mas populares con sus compañeros de salón. Cads uno del grupo tiene la responsabilidad de dibujar una de las comidas favoritas escojidas por el grupo. Luego van a ser una gráfica de dibujos y cuando es tiempo de reportar a la clase lo que han hecho, la información de todos los grupos se usará para hacer una gráfica de barras.

Su grupo tiene la responsabilidad de hacer la gráfica de dibujos y de completar el papel de apuntes.

Favorite Foods

Group Members: _____ _____

_____ _____ _____

1. What were the five foods your group decided were the favorites?

2. How did your group come up with them?

3. How did everyone participate?

Grocery Store

Text Lesson Focus: To multiply two digit factors by one digit factors.

Text Activity: Students individually solve 38 multiplication equations that are printed in their book.

Cooperative Learning Activity: Using a grocery price list, students answer questions involving multiplication and addition. They work with a partner to solve their problem and check the answers others give.

Materials: sheet for recorder, price list, paper to compute on,

Activity Task Card:

Grocery Store

Using the food price list, partners will answer at least four price questions. Each pair must also check four answers given by other partners.

Your group is responsible for answering all of the food questions and completing the recorder's sheet.

Ficha de Actividad:

El Mercado

Usando la lista de los precios de la comida, parajas van a contestar por lo menos cuatro preguntas sobre los precios. Cada pareja debe revisar las respuestas de las otras parejas.

El grupo tiene la responsabilidad de contestar todas las preguntas sobre la comida y de terminar el papel de apuntes.

Food Price List

Bacon	$1.19/lb
Beef Stew Meat	$1.99/lb
Broccoli	.39/lb
Carrots	.25/lb
Cherries	.79/lb
Chicken	.69/lb
Green Peppers	.49/lb
Ground Beef	.98/lb
Lettuce	.29/head
Mangos	.69/lb
Nectarines	.33/lb
Peaches	.39/lb
Pork Chops	$1.77/lb
Spinach	.42/bunch
Strawberries	.59/pint

Grocery Store

Group Members: _____ _____

_____ _____ _____

How much would it cost to buy:

1. Two pounds of broccoli, a pound of ground beef and one pound of cherries?

2. Three pounds of pork chops, a pint of strawberries and a head of lettuce?

3. Two pounds of nectarines, one pound of carrots and a pound of chicken?

4. One pound of green peppers, one pound of peaches and two pounds of beef stew meat?

5. Two bunches of spinach, a pound of bacon and one pound of mangos?

6. Three pounds of chicken, one pound on pork chops, and one bunch of spinach?

7. Two pounds of carrots, two pounds of green peppers and one pound of broccoli?

8. Three pounds of mangos, two pounds of peaches and one pound of beef stew meat?

9. Three pounds of ground beef, two pounds of bacon, and two pints of strawberries?

10. Three heads of lettuce, one pound of nectarines, and two pounds of cherries?

Grocery Store

Group Members: _____ _____

_____ _____ _____

1. Complete:

Number	Solved by	Checked by

2. How did all the members of the group participate?

National Park

Text Lesson Focus: To learn division facts with divisors of four or five.

Text Activity: Students complete 59 division exercises that are printed in their book.

Cooperative Learning Activity: Students discuss what they feel is important to have in a National Park. They divide the areas of the park among the members. Each member is responsible for drawing their portion of the park on their section of the mural paper. The group will create a division problem to represent their mural sections. The teacher should follow up with division problems written by all groups.

Materials: Mural paper, crayons, pencils, paints and brushes, markers.

Activity Task Card:

National Park

Your group is going to create a mural of a National Park. You need to discuss as a group what things you feel are important to have in a park, as well as what things you feel are not necessary to include.

You will divide the mural paper by the number of areas you wish to include. Each person is responsible for completing a section of the mural. The illustrating should be equally divided among the members of the group.

Ficha de Actividad:

Parque Nacional

Su grupo va hacer un mural de un Parque Nacional. Entre ustedes deben discutir lo que piensan que es importante para incluir en el parque, tanto como lo que creen que no es necesario para incluir.

Deben dividir el papel del mural por el número de areas que van a incluir en el parque. Cada uno es responsable por terminar una sección del mural. Los dibujos deben ser divididos igualmente entre los miembros del grupo.

National Park

Group Members: _____ _____

_____ _____ _____

1. What areas did your group decide to include in the park?

2. How did you come up with these areas?

3. How many sections did you divide the mural into? Write a division equation to show this.

4. How many park sections did each person complete? Write a division equation to show this.

5. Who completed each section of the mural?

Button Cards

Text Lesson Focus: To understand multiplication as repeated addition.

Text Activity: Students make button cards. They look at all the cards and count how many total buttons there are. Students compare the different amounts of buttons used.

Cooperative Learning Activity: Students make buttons cards and write addition and multiplication equations for the different number of card combinations. An entire class kit will be developed if many groups make cards with different numbers of buttons on them.

Materials: Tag board, buttons,

Activity Task Card:

Button Cards

Each member of the group is going to make two button cards. All of the cards will have the same number of buttons on it. The number of buttons will be between two and ten.

The group will write addition problems for each combination of cards, then convert them into multiplication equations.

Ficha de Actividad:

Tarjetas De Botones

Cada miembro del grupo va hacer dos tarjetas de botones. Todas las tarjetas deben tener el mismo numero de botones. El número de botones puede ser de dos a nueve.

El grupo va a escribir sumas para cada combinación de tarjetas, entonces van a convertir cada suma a un problema de multiplicación.

Button Cards

Group Members: _____ _____

_____ _____ _____

1. Complete:

Addition	Multiplication

2. How did all members participate?

Snack Bar

Text Lesson Focus: To multiply 2-digit factors by 1-digit factors, trading ones for tens when necessary.

Text Activity: Students solve 32 multiplication equations.

Cooperative Learning Activity: Using a menu, students decide what foods they would like to have for lunch. They must decide how many of each item they want to order and how much they will need to pay for the food.

Materials: Menu, sheet for recorder,

Activity Task Card:

Snack Bar

Your group is ready for lunch and everyone is very hungry! From the menu you are given, you will need to decide what food items to order, how many of each, and what the total cost will be.

hamburger	$1.50	milk	.55
cheeseburger	$1.75	juice	.90
chicken sandwich	$1.35	soda	.95
french fries	.95	milkshake	$1.25
onion rings	.85	ice cream cone	$1.05
curly fries	.90	frozen yogurt	.95

Ficha de Actividad:

Puesto De Refrescos

Su grupo esta listo para almorzar y tienen mucha hambre. Ustedes tienen que decidir que van a pedir del menu, cuantos de cada uno, y cuánto va ser la cuenta.

hamburguesa	$1.50	leche	.55
hamburguesa con queso	$1.75	jugo	.90
emparedado de pollo	$1.35	soda/refresco	.95
papitas	.95	batido de leche	$1.25
anillos de cebolla	.85	helado	$1.05
papitas enrolladas	.90	yogurt helado	.95

Snack Bar

Group Members: _____ _____

_____ _____ _____

1. Each member will take a turn figuring out the total price of a food item.

Item	Price	How many?	Total cost

2. How did everyone participate?

Decimal Driving

Text Lesson Focus: To find differences of one-place decimals.

Text Activity: Students individually solve 35 problems containing decimals, including 4 word problems.

Cooperative Learning Activity: Given a map, students answer two questions involving distances written in decimals, check two answers given by a teammate, and discuss several other questions.

Materials: Map, paper, sheet for recorder,

Activity Task Card:

DECIMAL DRIVING

Each group member must answer at least two of the questions about the map. Every person must also check at least two answers given by another group member. All questions must be answered. Each answer will be explained by the by the person who solved it. Everyone will participate in the discussion.

Ficha de Actividad:

Manejando Con Decimales

Cada miembro del grupo tiene que contestar por lo menos dos preguntas sobre el mapa. Cada uno tambien tiene que revisar por lo menos dos respuestas de otro miembro del grupo. Dentro de su grupo, deben contestar a todas las preguntas. El que encuentra la respuesta va a explicarla a los otros. Cada uno va a participar en la discusión.

Decimal Driving Questions (page 1)

Group Members: _____ _____

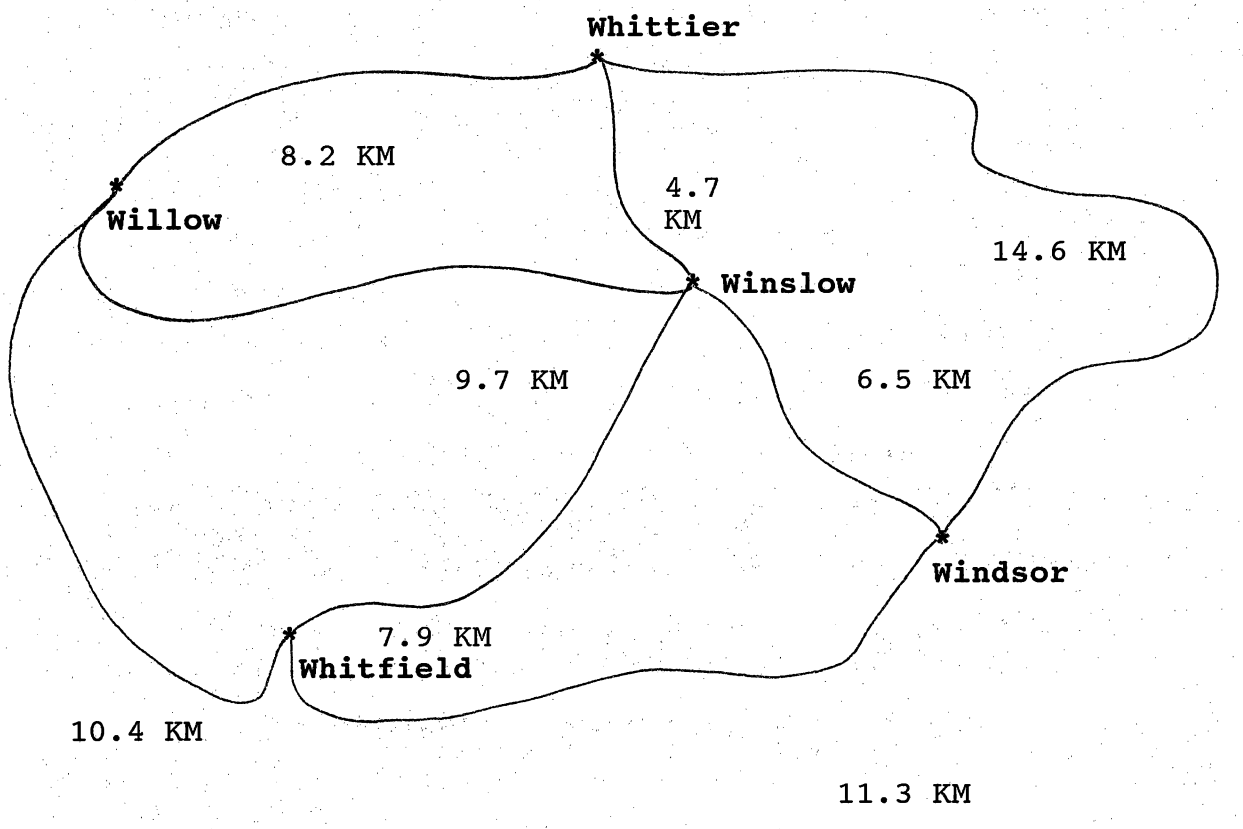
_____ _____ _____

	answered by	checked by
1. How far is it from Whittier to Winslow to Whitfield?		
2. How much farther is it from Whittier to Winslow than from Windsor to Winslow?		
3. How far is it from Willow to Winslow to Windsor?		
4. How much shorter is the drive from Windsor to Whitfield than from Windsor to Whittier?		
5. How much closer is Whitfield to Winslow than Willow to Winslow?		
6. How much longer is the trip from Whitfield to Willow than from Willow to Whittier?		
7. If you drive 14.4 kilometers from Windsor, what two cities might you visit?		

Decimal Driving Questions (page 2)

	answered by	checked by
8. If you drive 18.3 kilometers from Winslow, what two cities might your visit?		
9. If you drive 16.2 kilometers from Willow, what two cities might you visit?		
10. If you drive 14.4 kilometers from Whittier, what two cities might you visit?		
11. If you drive 12.6 kilometers from Whitfield, what two cities might you visit?		

Decimal Driving Map



Kites

Text Lesson Focus: Determining fractions from given dimensions.

Text Activity: Students work in groups to produce a kite. They compare the dimensions of the kite and determine what fraction the smaller measurements are of the larger ones.

Cooperative Learning Activity: Students work in groups to produce a kite. They analyze each dimension to find what 1/4, 1/3, and 1/2 would be.

Materials: Newsprint, balsa wood for frame, kite string, tail ties, glue, stapler, markers, string,

Activity Task Card:

Kites

Your group is going to design and construct a kite. As a group you will decide what shape and size it will be and how it will be decorated.

Each member is responsible for answering at least three size questions about the kite, as well as checking at least three answers given by other members.

Ficha de Actividad:

Volantines/Cometas

El grupo va a diseñar y construir un volantín. Como grupo van a decidir la forma, el tamaño y cómo lo van decorar.

Cada miembro tiene la responsabilidad de contestar por lo menos tres preguntas sobre el volantín y de revisar por lo menos tres de las respuestas dadas por los otros miembros.

Kites

Group Members: _____ _____

_____ _____ _____

Complete:

	solved by	checked by
kite width is		
1/2 kite width is		
1/3 kite width is		
1/4 kite width is		
kite length is		
1/2 kite length is		
1/3 kite length is		
1/4 kite length is		
tail length is		
1/2 tail length is		
1/3 tail length is		
1/4 tail length is		
length of kite & tail		
1/2 l. kite & tail		
1/3 l. kite & tail		
1/4 l. kite & tail		

Kites

Group Members: _____ _____

_____ _____ _____

1. How did your group decide who was going to answer which questions?

2. How did your group decide what type of kite to make?

3. How did your group decide how to make the kite?

4. What materials did your group use to make the kite?

5. Which part of the kite did each person make?

Let's go to the Beach

Text Lesson Focus: To find sums of one place decimals.

Text Activity: Students solve 25 addition problems each containing a one place decimal.

Cooperative Learning Activity: Students figure out the price of a combination of items using a store advertisement They check two answers given by their group members and discuss the other sums given.

Materials: advertisement price list,

Activity Task Card:

Let's go to the Beach

It is time to get ready to go to the beach! The stores are having sales on the items people need to use at the beach. Each member of the group will make two purchases of the items listed on the advertisement. Each purchase will include at least four items. All members will also check two orders placed by other members to make sure their total is correct.

Your group is also responsible for completing the recorder's sheet.

Ficha de Actividad:

Vamos A La Playa

¡Ya es tiempo de prepararse para ir a la playa! Las tiendas tienen ventas de algunas cosas necesarias para la playa. Cada miembro del grupo va a comprar dos veces escojiendo de las cosas que estan en el anuncio. Cada compra tiene que incluir por lo menos cuatro cosas. Todos van a revisar las sumas de las compras para saber que estan bien.

El grupo tiene la responsabilidad de completar el papel de apuntes.

Let's go to the Beach!

SPECIAL SALE****SPECIAL SALE PRICES****SPECIAL SALE

BEACH TOWEL----------$6.50

SUN GLASSES----------$3.70

BEACH BALL----------$1.50

SUN SCREEN----------$2.80

SAND TOYS----------$1.30

SANDALS----------$4.60

COOLER----------$3.20

RAFT----------$2.90

BEACH BAG----------$4.10

SPECIAL SALE****SPECIAL SALE PRICES****SPECIAL SALE

Let's go to the Beach! (page 1)

Group Members: _____ _____

_____ _____ _____

Complete:

1. Items purchases by _____ were:

Total price:

Checked by:

2. Items purchases by _____ were:

Total price:

Checked by:

3. Items purchases by _____ were:

Total price:

Checked by:

Let's go to the Beach! (page 2)

4. Items purchases by _____ were:

Total price:

Checked by:

5. Items purchases by _____ were:

Total price:

Checked by:

6. Items purchases by _____ were:

Total price:

Checked by:

7. Items purchases by _____ were:

Total price:

Checked by:

Let's go to the Beach! (page 3)

8. Items purchases by _____ were:

Total price:

Checked by:

9. Items purchases by _____ were:

Total price:

Checked by:

10. Items purchases by _____ were:

Total price:

Checked by:

Dice Roll

Text Lesson Focus: To write fractions for parts of sets, using related pictures.

Text Activity: Students look at 10 different illustrations and determine what fraction of the set is different.

Cooperative Learning Activity: Students roll their dice and take turns naming the fraction of the dice that show odd or even numbers.

Materials: Dice pattern (two for each member), markers, crayons, tape,

Activity Task Card:

Dice Roll

Each member of the group is going to make a pair of dice using the pattern provided. All dice will be put in a box and tossed out. All members will examine the dice and decide which fraction of the dice are odd and which fraction are even. Taking turns, one member will name which fraction of the dice are odd and even. Another member will check, then the group will discuss why they agree or disagree. Each member will have a chance to solve at least two times.

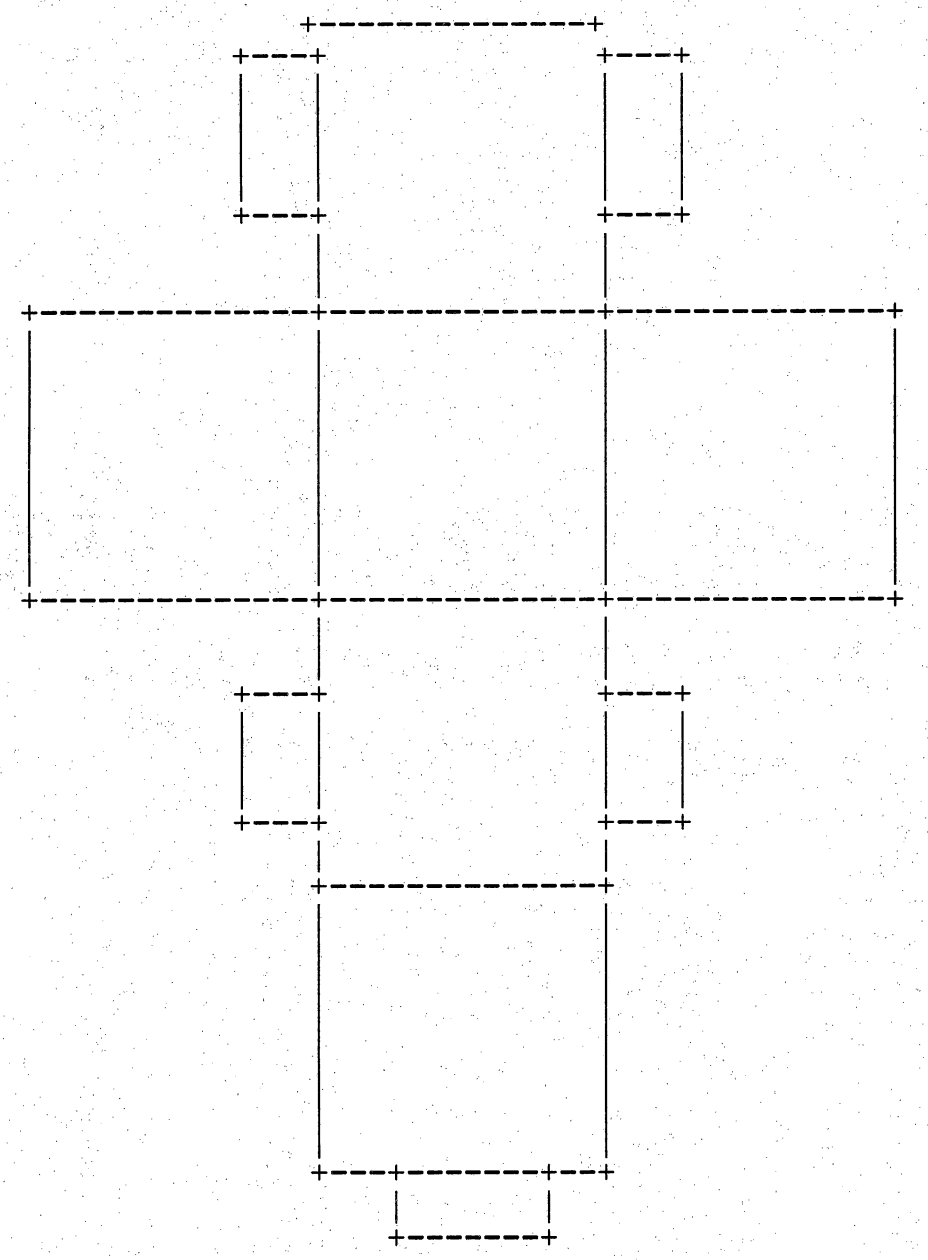
Ficha de Actividad:

Dados

Cada miembro del grupo va hacer un par de dados usando el patrón que está incluido. Todos los dados se van a tirar de una caja al mismo tiempo. Todos los del grupo van a examinar los dados y decidir la fracción de dados que muestran números impares y cual es la fracción de los que son pares. Tomando turnos, cada uno del grupo va a nombrar la fracción de dados que son impares y pares. Otro miembro va a revisarlo y el grupo luego va a discutir si estan de acuerdo o no. Cada uno va a tener por lo menos dos oportunidades para resolver.

Dice Roll

PATTERN



Dice Roll

Group Members: _____ _____

_____ _____ _____

1. What did your group learn about fractions from the dice roll?

Fraction Strips

Text Lesson Focus: To compare fractions.

Text Activity: Students use five fraction strips printed in their text to solve 20 problems involving size comparison.

Cooperative Learning Activity: Each student will create their own fraction strip by dividing a strip into sections. They will compare their strip to another to solve an equation and decide which fraction is greater.

Materials: Fraction strips, metric rulers, standard inch rulers.

Activity Task Card:

Fraction Strips

Each member will select a strip and divide it into fractions. Each strip will be divided into either thirds, fourths, fifths, sixths, or eights- no two strips will be the same. Students will compare strips and decide which fraction in the equation is larger.

Ficha de Actividad:

Tiras De Fracciones

Cada miembro va a escojer una tira de papel y la va dividir en partes iguales. Cada tira se va a dividir en tercios, cuartos, quintos, sextos u octavos. Cada tira se divide usando diferentes fracciones. Comparen dos tiras a la vez y decidan cual muestra la fracción mas grande.

Fraction Strips

Group Members: _____ _____

_____ _____ _____

1. How did your group decide who was going to make which fraction?

2. Did all members participate?

3. Circle the largest fraction, use your strip to solve.

A. 1/6 1/3

B. 1/5 2/8

C. 3/4 6/8

D. 2/3 2/4

E. 2/5 2/3

F. 3/5 3/6

G. 7/8 4/5

H. 4/8 4/6

I. 1/8 1/4

J. 1/3 2/6

K. 3/4 5/6

4. Would you rather have 1/3 or 2/6 of your favorite cake? Discuss and write your group's answer.

Resources

Brown, M. B. (1990). Activities for cooperative learning. Huntington Beach, CA: Teacher Created Materials.

Cohen, E. G. (1986). Designing groupwork. New York: Teachers College Press.

Davidson, N. (Ed.). (1990). Cooperative learning in mathematics. Menlo Park, CA: Addison-Wesley.

Slavin, R., Sharan, S., Kagan, S., Hertz-Lazarowitz, R., Webb, C., & Schmuck, R., (Eds.). (1985). Learning to cooperate, cooperating to learn. New York: Plenum Press.

Willoughby, S. S., Bereiter, C., Hilton, P., Rubinstein, J. H. & Scardamalia, M. (1981). Bargains galore. LaSalle, IL: Open Court.

Appendix C

Teacher Review Sheet

Thank you for reviewing these cooperative learning mathematics activities! Please return the comment sheet to me as soon as you are finished with it. The lesson activities are yours to keep, share, change, or just get ideas from. I hope you can use some of them in your classroom.

If your have any questions please feel free to call me.

Sincerely,

Jeanne Dunaway
252-8222
1000 Broadway Ave.
Barstow, 92311

Review of Cooperative Learning Activities

Name_____

Phone_____

1. Given an Addison-Wesley text and the documentation from this project, would I understand how to implement these activities in my classroom? Discuss.

2. I believe these cooperative learning activities would help my students master the lesson objectives. Discuss.

3. Recommended changes: (please be specific)