A project involving cooperative learning pairs working with problem-solving computer software in a middle school setting

Timothy J. Feinup
University of Northern Iowa

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Abstract
Within the past ten years, schools have increasingly embraced the development of the computer as an important media aid in the instruction of problem-solving thinking skills. Cooperative learning strategies, rather than individualistic or competitive learning styles, during this same period, have become a major trend in developing conceptual instructional tasks, including the development of problem-solving strategies. This paper presents a curriculum development project for middle school students that combines the planned activities and outcomes of computer-assisted instruction with cooperative learning to develop problem-solving strategies and positive social skills.
A PROJECT INVOLVING COOPERATIVE LEARNING PAIRS WORKING WITH PROBLEM-SOLVING COMPUTER SOFTWARE IN A MIDDLE SCHOOL SETTING

A Research Paper
Submitted to
The Department of Curriculum and Instruction
In Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

by
Timothy J. Fienup
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This Research Paper by: Timothy J. Fienup
Entitled: A Project Involving Cooperative Learning Pairs Working with Problem-Solving Computer Software in a Middle School Setting

has been approved as meeting the research paper requirement for the Degree of Master of Arts in Education.

Sharon E. Smaldino
Director of Research Paper

Sharon E. Smaldino
Graduate Faculty Advisor

Joan E. Duea
Graduate Faculty Reader

Roger A. Kueter
Head, Department of Curriculum and Instruction
A Project Involving Cooperative Learning Pairs Working with Problem-Solving Computer Software in a Middle School Setting

Timothy J. Fienup

ABSTRACT

Within the past ten years, schools have increasingly embraced the development of the computer as an important media aid in the instruction of problem-solving thinking skills. Cooperative learning strategies, rather than individualistic or competitive learning styles, during this same period, have become a major trend in developing conceptual instructional tasks, including the development of problem-solving strategies. This paper presents a curriculum development project for middle school students that combines the planned activities and outcomes of computer-assisted instruction with cooperative learning to develop problem-solving strategies and positive social skills.
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CHAPTER I

Introduction

Introduction to the Project

Concern over public education has existed since this country declared its independence over 200 years ago. The major purpose of our schools today is to empower and prepare students both academically and socially to be successful in their adult lives. Parents, researchers, teachers, and society in general have expressed concerns and provided hard evidence that today's graduates are socially unprepared and possess lower achievement scores than graduates of decades past.

Within the past 10 years however, the computer has been increasingly utilized as a viable instructional tool and cooperative learning has rapidly become a major educational strategy for enhancing achievement and social skills. This study will combine this tool and this strategy into a project for middle school students.

Statement of Purpose

The purpose of this study is to briefly review the current literature on computer-assisted instruction and cooperative learning and their positive benefits on problem-solving skills. A curricular project developed to incorporate these into a middle school learning setting will
be described. The project will focus on the following components: (a) analysis of the factors affecting curriculum; (b) a needs statement for middle school students; (c) a plan of what will be taught; and (d) an evaluation plan for what will be taught.

**Brief Review of Computer-Assisted Instruction**

During the same time that cooperative learning received so much attention in association with educational achievement, microcomputers and computer-assisted instruction have not only been introduced, but are becoming a factor in education today.

While most of the research dealing with achievement scores and computer-based learning has been done with individual students, some researchers have been looking at achievement scores and social outcomes when students learn cooperatively with microcomputers. Students in computer assisted instruction groups are found by research to learn better or equally as well as those alone at the microcomputer (Dalton, Hannafin & Hooper, 1989; Johnson, Johnson & Stanne, 1985; Trowbridge & Durnin, 1984; Webb, 1984; Wizer, 1987). This finding is a boon to school districts all over the country who share the problem of acquiring adequate numbers of microcomputers for their school populations. Becker (1987), Caissy (1987), Cosden & Lieber (1986), Crist-Whitzel (1984), Dalton, Hannafin & Hooper (1989), Hooper & Hannafin
(1988), Johnson & Johnson (1985), Wizer (1987), and Yueh & Alessi (1988) all support this position and declare a solution of combining both cooperative learning and computer-assisted instruction in their respective articles. Becker is cited by Yueh and Alessi (1988) as noting that nearly 50% of middle school students work in groups or pairs during free time with computers.

These researchers, along with others, are developing ways to take two distinct and successful teaching approaches, and combining them to create a powerful learning strategy for educators to use for increasing achievement scores, developing verbal and social abilities in students, and improving critical thinking skills.

During the 1980's, researchers have stated that computer-based instruction has helped both students' attitudes and performance in learning. Johnson & Johnson (1985), Webb (1984), and Wizer (1987), all stated that cooperative learning effectively increased achievement after working with microcomputers during computer-assisted instruction lessons. Dalton, Hannafin, and Hooper (1989) reported findings that indicate both low and high achievers' scores increased from cooperative learning methods on the computer. Johnson and Johnson (1985) have developed ways for teachers to implement core subject lessons using computers in cooperative groups. They feel that any activity can be adapted or altered into a
cooperative activity, and that it does not have to be exclusively carried out at the computer. They see the computer as a tool to focus social and academic interactions and learning. Their article includes sample evaluation forms and lessons that teachers can use to combine both cooperative learning and computer-assisted instruction.

Generally speaking, a few underlying themes in the articles and research find educators and researchers agreeing in principle that both computer-assisted instruction and cooperative learning need to be carefully examined and used more in the learning process. The development of grouping activities that have each group member actively involved and accountable with the teacher acting as a facilitator is important. There will continue to be many more students than computers in the schools (Becker, 1987; Hooper & Hannafin, 1988), and cooperative learning activities enable equal access to computers in education (Crist-Whitzel, 1984; Hooper & Hannafin, 1988; Savard & Cotton, 1983).

Another theme is that the quality of educational software can be improved by developing more programs that will encourage learning cooperatively and sharing (Friedman, 1983). Increased opportunities for students to cooperatively solve problems that involve higher level thinking will be made available to schools.
Researchers agree in principle on needing to concentrate on increasing our knowledge about cooperative strategies and how to implement them (Johnson & Johnson, 1989; Slavin, 1988). When teachers use cooperative learning and computer-assisted instruction in their classrooms, they can enhance the advantages of each.

**Brief Review of Cooperative Learning**

Although it is not a new approach to teaching, cooperative learning came into the educational forefront as a learning strategy to assist learning in the late 70s and early 80s. Since then, many researchers and instructors have studied cooperative learning's effects on students, attempting to measure achievement and social outcomes, comparing them to the traditional approaches of competitive and individualistic styles of learning (Johnson & Johnson, 1989; Slavin, 1989-90; Webb, 1982; Wizer, 1987).

 Cooperative learning involves grouping students and then giving the entire group an assignment or a problem to solve, making sure that each group member masters the material while interacting positively within the group (Johnson and Johnson, 1985; Johnson, Johnson and Holubec, 1990). The responsibility for learning falls not only on the instructor, but on each member of the group as well. The teacher's role becomes more of a facilitator and monitor. The teacher makes sure that all members of the group actively discuss and
contribute during the lesson, master the assigned material, receive awards for the final group product based on an overall criteria for excellence, and are held individually accountable for the learning (Schultz, 1989-90; Smith, 1985). Johnson and Johnson (1989 and 1989-90) emphasize that there are 5 basic elements that the teacher must plan within each lesson. These elements are positive interdependence, face-to-face promotive interaction, individual accountability, social skills, and group processing. Together, they place the responsibility of learning upon the students. Positive interdependence gives students a "sink or swim together" feeling within the group. They cannot succeed as a group unless each member succeeds. Face-to-face promotive interaction allows the students to help and explain the lesson material and assignments to each other. Individual accountability makes each student master the assigned work. Social skills are positive; each group member has to communicate, instruct, trust, and encourage each other. Sapon-Shevin & Schniedewind (1989-90) encourage teachers to create student groups that care and support each other while working toward a common goal. Group processing occurs when the instructor has the students stop from time to time and assess how well their group is doing and plan ways to improve.
There are studies available that indicate that once groups are formed and the lesson content chosen, the teacher can set up the degree of cooperation within groups by providing awards for positive interaction. These awards and incentives within each group can be worked on cooperatively, competitively, or individually (Hooper & Hannafin, 1988; Slavin, 1983a; Yueh & Alessi, 1988).

Johnson, Johnson and Holubec (1990) and Slavin (1983b) proposed that to make cooperative learning in groups successful, students also needed high individual accountability, usually in the form of grades or other individual awards and recognition. Rewards for a group product have low individual accountability for that product because the teacher cannot determine how much each individual has contributed to the success of the group. On the other hand, if a group award is based on the sum of individual testing, each individual's contribution to the task is more evident, but there is no guarantee that the group functioned well together. Since one major goal of grouping students cooperatively on a problem is to encourage them to discuss and help each other, rewarding them solely on individual achievement will tend to break down group help and sharing. Indeed, you could be back to individual, traditional learning.
In both Wizer's (1987) and Yueh and Alessi's (1988) research, it is pointed out that past social psychologists and researchers have termed "distributive justice" as the way to combine both individual accountability and group success. Rewards for group efforts help insure that the members work together in a cooperative way, but rewards for individual achievement are deemed as fair when each member is rewarded for his or her own contribution. Other researchers (Johnson & Johnson, 1989-90; Slavin, 1989-90) claim teachers who set up both types of rewards in a cooperative learning setting will best insure fairness and accurate accountability for each member, as well as increasing achievement scores for all students.

Because giving and receiving help and interacting positively within a group relates positively to achievement, grouping students in a cooperative learning situation also effects how well group members interact with each other and ultimately achieve (Webb, 1982). Webb (1985) and Yueh & Alessi (1988) both discovered that medium-ability students in all medium-ability groups learned more and were more likely to help each other than if they were in a group with a low-ability and a high-ability student. It was found that the medium-ability student in a heterogeneous group will be left out more in the group interactions and peer tutoring because
the high-ability student will be working often with the low-ability student.

Research also indicates that not only does grouping students help students achieve and develop interpersonal skills, but it also keeps them on task better. Yueh and Alessi (1988) discovered that grouping with both individual and group reward structures encouraged students to stay on task 95% of the time, compared to 86% for groups working solely for a group award. Johnson, Johnson, and Stanne (1985) noted similar results.

Other studies have shown that learning improves positive social interactions. Wizer (1987) found that students' self-esteem and interpersonal communication skills were enhanced, while involvement among all group members toward the group and individual goals was increased. Webb (1982) states the relationship between receiving and giving help within a group and achievement to be a positive one. This suggests that the person relating information also remembers and thinks about it. This interactive exchange therefore helps both the giver and the receiver achieve higher test scores on the group's material.

It must be remembered that although improved interpersonal and social skills are important and beneficial, increased achievement of all group members is the ultimate goal of cooperative learning methods.
CHAPTER II
Factors Affecting Curriculum

The administrators in the Marshalltown School System began finding funds to purchase Bell and Howell and Apple II family computers during the late 70's and early 80's. Naiman (1987) cites that in the late seventies only a few math, science, and computer science teachers saw the educational importance and potential of the computer; but by 1980, administrators were trying to find funds to buy hardware and software, as well as how to best spend their obtained funds. In Marshalltown, like the rest of the nation, these few microcomputers were generally found in use in secondary mathematics and science classrooms for drill and practice and tutorial programs and programming. Becker (1987) has written that since 1982 most schools have begun using the computer for at least a part of each week in their instructional programs.

By the mid 1980's the three Marshalltown Middle Schools, Anson, Lenihan, and Miller, had a group of 12 computers that were rotated to all of the 7th, 8th, and 9th grade math classes in 3 to 4-week periods of time throughout the school year. During this time, the students worked together to create low-resolution graphics and other BASIC programs. Because it was a break from the traditional math classes, and the computer was new and exciting, this three-week period was
enjoyable and motivational to the students. However, because of apprehension shown toward the computer by some math teachers and the 3 to 4 weeks lost in the math curriculum, the math department wanted to create a computer literacy department separate from their own.

During that same period of time, the business education department at the high school proposed that a short-term course of keyboarding be introduced to all sixth grade students in the fall of 1985. This was due to increasingly poor entry-level keyboarding habits of the middle school students, the effort to try to reteach them, and the wide range of knowledge, exposure, and accessibility the students had with the computer. It was also felt that Marshalltown was falling behind what was currently being done by other school districts in the state of Iowa and around the country in the areas of keyboarding and computer literacy.

By the fall of 1985, a keyboarding/computer literacy committee was formed. Over a series of meetings that fall, it was decided to submit an Educational Improvement Project application to the Iowa Department of Public Instruction. The project title was Keyboarding/Computer Literacy for the Middle School. The teachers and administrators on the committee decided it was best to create three middle school computer labs rather than find funds for seven elementary locations. They also decided to teach keyboarding and "even"
the students' computer knowledge during their sixth grade year. The goal was to give the students opportunities to apply the technology in grades 7-9. To achieve this, each computer lab was to be available to students and teachers in each building when the keyboarding/computer literacy classes were not in session.

The Department of Public Instruction approved the educational improvement project proposal and allocated $74,024 which was matched with $24,675 from our district budget to equip the lab with 13 Apple II computers (7 new systems with 128K of memory), 12 used IBM Selectric electric typewriters, appropriate wiring and furniture, 2 Imagewriter printers, $300 for supplies, and salaries for 1 full-time paraprofessional for each lab, to assist the instructor and run the lab when he/she wasn't there, and 1 full-time qualified keyboarding/computer literacy instructor. With the local Area Education Agency located in Marshalltown, a wide-range of software, many selections public domain, was available to check-out or obtain permanently.

During the first year of instruction in 1987-88, each sixth grader evenly split time between a typewriter and a computer during keyboarding, but shared a computer during computer applications instruction. This practice was shared by what Yueh and Alessi (1988) and Becker (1984) cited that
students in the country had to work in pairs on computers because there are far more students than computers.

Additional monies and grants have enabled Marshalltown to improve and expand the middle school's keyboarding and computer applications curriculum, over the past 4 years.

Two major changes that affected the middle school keyboarding/computer applications program and the use of the computer labs took place in the spring of 1989. First, declining enrollment and a depressed local economy caused the Marshalltown School Board to close Lenihan school and move the ninth graders to the high school for the 1989-90 school year. After some difficulty, the hardware, software, and furniture of the Lenihan computer lab were evenly divided between the Anson and Miller schools labs. In addition, fourteen new Apple IIGS computers and memory expansion cards, to update all of the 64K computers to 128K, were purchased. Despite projected classroom sizes of 25-29 students, enough computers would be available for each lab so that every student would have one. Second, an eighth grade computer applications elective class was added to the middle school curriculum. This addition to the existing middle school's curriculum would help the students retain the skills taught in sixth grade until high school and would enable them to receive additional word processing, data base, and spreadsheet instruction. It also provided a three or four
week period of time for students to work with the software and project cards developed for this project.

**Needs Statement**

Over the past 4 years of developing and learning how to utilize computers as an instructional tool, there have been widespread teacher and subject matter uses. Most staff members have begun with uncertainty and apprehension toward the combination of the microcomputer and his/her subject area. Each has also witnessed the positive motivational effect on students and the results of such use. They have realized the importance of the microcomputer as an educational tool and many have become an ally toward its continued use at the middle school level. Nearly all of the staff members use this technology now to assist their students in learning as well as developing classroom activities and written materials such as tests, worksheets, signs, and project cards for students to use. Unfortunately, most of these activities have been hampered educationally by lack of availability, accessibility, and other scheduling and time restraints. Additionally, the instructor's assignments have dealt primarily with individualistic or competitive assignments requiring lower-level thinking skills that do not fully utilize the potential value of using the computer to aid instruction.
Instead, the students love to work together to solve problems provided by challenging, entertaining, and thought provoking software when enough preparatory instruction is provided by the teacher. Software programs that present non-life threatening simulations or fantasy adventures, applicable life problems to solve, fun applications of various input and output devices such as a mouse, speakers, and printers, or higher-level thinking problems in a competitive situation are the most popular with students.

Therefore, middle school students need to be given time and opportunities to use the microcomputer to work with software that will improve problem-solving strategies and higher level thinking skills while they interact positively. This project has been developed to help students achieve these goals.
CHAPTER III
A Plan of What Will Be Taught

The continually expanding variety of problem-solving software and ways students can interact with the programs have not only led to complex problems and challenges for students working on software, but also on the methods to resolve them. When problem-solving methods and positive social skills are introduced and pretaught carefully by instructors, problem-solving software with their challenging tasks can then absorb students in their learning. For this project, the students need to be introduced to, instructed on, and feel comfortable with three general prerequisites before using any of the project cards.

First, students need to be able to successfully operate the microcomputer and its peripheral devices in order to appropriately interact with the problem-solving software. These instructions should include general objectives, such as correctly handling and inserting software, starting up and shutting down the microcomputer system, and putting software and any other materials away. More specific objectives, like loading paper in a printer, formatting a data disk to save their work, and learning how to operate a mouse, joystick, printer, or other peripherals can also be included.

Second, students need to be taught methods and strategies for solving the problems that the software and
hardware present. *Solutions Unlimited* uses a general method adopted for use with most of the software in this project. This general plan is introduced before the students use the project cards and has four parts, Hey Wait!, Think, See, and So? The first part, 'Hey Wait!', alerts the students that there is a problem to solve. 'Think' allows students to brainstorm for possible solutions. 'See' lets students try out their solution to see if it will work. 'So' has students evaluate whether or not they have solved the problem, and if not, alerts them to brainstorm again.

Each project card or software program also involves more specific strategies to help the students successfully solve the problems they are given. Some of these include map-making, note taking, logical progressions, deductive reasoning, and generating alternatives. Students may also combine strategies or develop strategies of their own, depending on the nature of the software package and project card they are working with.

Third, students must be paired heterogeneously, by the teacher, and taught grade level appropriate cooperative and social skills to ensure the greatest opportunity for group success and individual accountability. After students are paired, they are seated at the same microcomputer station. The instructor then teaches and demonstrates the positive social skills decided to be most important to the students.
After the students are taught the targeted social skills, both formative and summative processing are given throughout the several weeks the students work on the problem-solving software. This project best lends itself to instructing students positively in each of the following areas: equal sharing, trading jobs and responsibilities where one is the secretary and the other is the computer operator, showing concern and encouragement for each other, communicating ideas positively, using quiet voices, and relating information in positive ways to each other.

Once the students have all been instructed on the proper behaviors for these three general prerequisites, then the instructor briefly introduces each software package and project card and allows students to choose what is available for them to choose and work with (see Appendix for project cards).

The teacher's role then becomes a combination of facilitator, observer, encourager, and evaluator, while each student pair is now in charge of their learning and proceeds through each project card and software package at their own rate. Students must complete each project card they choose before getting a different one. Only when students meet the requirements on each project card, can they hand in or show their work to the instructor before choosing a different one.
CHAPTER IV

An Evaluation Plan of What Will Be Taught

The teacher's role in the educational process begins in earnest when the students begin working cooperatively in pairs with the problem-solving software. Once groups are chosen and students are taught the positive social skills needed to work together, much of the teacher's time should be spent observing group members to see what problems and successes they are having with the project card and in working collaboratively. A wide variety of observation instruments and procedures can be used to monitor student progress. These evaluation procedures will assure that the students are not solely graded on a finished product, but that each has successfully learned how to use computer hardware and software in appropriate ways, demonstrated how to apply problem-solving strategies to finish tasks, worked positively with their partner, and has been held individually accountable for learning the task.

During work times the instructor should make formative observations using checklists or T-charts of students using the computer hardware and software. Depending on the assignment, students may have to create and then save data to a data disk or use a mouse, joystick, modem, printer, or a koala pad to successfully complete the tasks outlined on the project cards. Data the instructor loads from the students'
data disk, print-outs of assigned tasks, or pictures and scores seen on the monitor screen are examples of summative evaluations of successful usage of hardware peripherals and software.

Each group should also be observed using various problem-solving strategies or methods while working on their task. The results or products made from each of the problem-solving disks will evaluate the group on their ability to solve problems using the methods and strategies they have been previously introduced to, whether at the beginning of this unit or from previous experiences. Charts, notes, maps, results and scores, successful or unsuccessful simulation solutions, print-outs, sounds, and other outputted information from the project card all help evaluate the ability of a group to solve problems and interact positively to accomplish a task.

During each class period, the teacher should also observe and record instances of group members interacting positively and cooperating together. Each student should be observed sharing ideas, contributing to the group's task, and providing encouragement or other positive communication when needed.

Students can also help instructors evaluate how well they have met the objectives of this project. Time should be set aside at the end of class times for students to share
oral or written comments about how well they have interacted with their partner. Students can share successes or failures within their group or to the entire class. Discussion must be positive where students can explain what they have done well together and things that they should try to improve upon next time.

The formative and summative procedures given in this chapter will insure that each individual student, as well as the group, will have an accurate and reflective evaluation of their efforts during the time this unit is given. Grades should be awarded based upon both individual and group accomplishments.

**Summary**

The purpose of this paper has been to review the current literature on computer-assisted instruction and cooperative learning. Using this information a project was developed for using the microcomputer in a middle school setting to assist the instruction of problem-solving thinking skills while pairing students to learn cooperatively.

An analysis of some research indicates that the microcomputer has been traditionally used in the middle school for individual learning using software that focuses primarily on concrete thinking (Caissy, 1987; Eiser, 1986). Recently, however, there has been increasing availability of software to middle school learners to help develop a wide
variety of problem-solving thinking strategies to assist them in their transition from a concrete mode of thinking to an abstract one.

Studies have also shown that students learn better in small groups rather than by themselves while working at the microcomputer. Although most school districts are attempting to purchase enough computers so that every student in a class can use one, studies have shown that achievement scores for grouped students are equal to or higher than those scores for students who work alone.

Teachers should therefore plan, implement, and evaluate activities that utilize the benefits and advantages of learning, helping, and supporting each other cooperatively while enhancing problem-solving strategies by using the microcomputer. This project has identified thirty problem-solving software packages and project cards. When middle school students have learned how to properly use hardware and software, a few selected problem-solving techniques, and appropriate positive social skills, the tasks on the project cards will help give them strategies that they can use to help them solve real-life problems while interacting more positively with their peers.

This project is one plan that can be used by teachers who want to use the microcomputer to assist students in abstract thinking and cooperative strategies. Other software
development and educational research is needed to show educators and students the real power of the microcomputer as a media aid in combining problem-solving strategies and cooperative learning skills.
References


Appendix A
APPLE IIgs TOUR DISK (Old or New Disk):  PROBLEM SOLVING SOFTWARE UNIT

APPLE IIgs TOUR PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIEUP)

APPLE IIgs TOUR DISK:

1. This 3.5" floppy disk must be used with a IIgs computer. It will take at least 3 minutes to boot up. Please be patient.

2. This diskette contains programs and educational information about your Apple IIgs, its parts and peripherals, and applications about how you can use your Apple IIgs microcomputer for home, school and office. The main rule is read and follow the instructions from the tour disk and have FUN as you LEARN.

3. Whether you are using this alone or with a partner, your ASSIGNMENT is to complete each program listed with each pull-down menu. (The computer will show you the programs and pull-down menus later.) For now, sit back and enjoy.

4. If you are with a partner, take turns operating the computer or mouse. Talk to each other and share information as you use this disk. When class time is over, remember where you left off so you can start there again for the next class.
WHERE IN THE USA IS CARMEN SAN DIEGO?:

1. Load disk and follow instructions.

2. Sign in. (use your own name)

3. This disk allows you to be a detective. You get a case to work on and you solve it by investigating in each city that the criminal goes to. When you get enough information on the suspect, you have to get a warrant for his or her arrest. Then you follow the criminal until you catch him or her. YOUR ASSIGNMENT IS: Solve at least 5 cases over several class times.

4. Take notes and use the map and almanac.

5. You will need to use several class times to solve as least 5 cases. I need to see your name on the "Hall of Fame" to get credit.

0-1 cases = Gumshoe

2-3 cases = Jr. Investigator

4-5 cases = Investigator

6+ cases = Sr. Investigator
WHERE IN THE WORLD IS CARMEN SAN DIEGO?: PROBLEM SOLVING SOFTWARE UNIT

CARMEN SAN DIEGO—WORLD, PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIEHUP)

WHERE IN THE WORLD IS CARMEN SAN DIEGO?:

1. Load disk and follow instructions.

2. Sign in. (use your own name)

3. This disk allows you to be a detective. You get a case to solve and you do so by investigating in each city that the criminal goes to. When you get enough information on the suspect, you have to get a warrant for his or her arrest. Then you follow the criminal until you catch him or her.

   YOUR ASSIGNMENT IS: Solve at least 5 cases over several class times.

4. Take notes and use the atlas and almanac.

5. You will need to use several class times to solve at least 5 cases. I need to see your name on the "Hall of Fame" to get credit.

   0 cases solved = Rookie

   1-3 cases = Sleuth

   4-5 cases = Private Eye
WHERE IN EUROPE IS CARMEN SAN DIEGO?:

1. Load disk and follow instructions.

2. Sign in. (use your own name)

3. This disk allows you to be a detective. You get a case to solve and you do so by investigating in each city that the criminal goes to. When you get enough information on the suspect, you have to get a warrant for his or her arrest. Then you follow the criminal until you catch him or her. YOUR ASSIGNMENT IS: Solve at least 5 cases over several class times.

4. Take notes and use the atlas and almanac.

5. You will need to use several class times to solve at least 5 cases. I need to see your name on the "Hall of Fame" to get credit.

0-1 cases = Gumshoe

2-3 cases = Jr. Investigator

4-5 cases = Investigator

6+ cases = Sr. Investigator
1. Your teacher has checked out the DataLinker package from AEA 6. It includes a modem card that your teacher has put into slot 2 of the Apple IIe computer in the back of the computer lab. The card has been plugged into the telephone jack into the wall and a switch downstairs in the office has been flipped to "modem", so that we can use one of the telephone lines.

2. Take the DataLinker disk and load it into drive 1 of the computer. Press Return to get past the title screen. The first thing you need to do after reading the instructions on the DataLinker "Help Card" is to call AEA 6 and talk to the operator by typing on the keyboard.

3. To dial, type: AT_D_753-8821 and wait for the computer to "dial" the number. When the screen says "Connect 1200", press Return. You can refer to the "Help Cards", manual or just talk to the operator to help you operate the modem.

4. Your ASSIGNMENT is to have the operator REGISTER you. Everyone that is a NEW user must be Registered and then you will receive a PASSWORD that will allow you to send and receive private mail and to use a number of BULLETIN BOARDS within the system set up through AEA 6. Please remember your Password. You will work with the modem in 1/2 hour time periods for the next 2-3 class times. If you want to come in other times once you’ve been registered, that is fine. Make all arrangements with your teacher.
Walt Disney CARD AND PARTY: PROBLEM SOLVING SOFTWARE UNIT

CARD AND PARTY PROJECT CARD-PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS-T. FIEHUP)

CARD AND PARTY:

1. Carefully put the Card and Party Shop disk, Side A, into a 5.25" drive with an Apple IIe. Press Open Apple, Control and Reset to "Boot" up the disk.

2. Choose "Have A Party" from the main menu and press Return.

3. Arrow down to "SIGN" and press Return. Next, you want to pick "DESIGN YOUR OWN" and press Return.

4. Follow the directions and soon you will see a screen with an empty frame or design area for your sign to be made. You will also see the "DESIGN MENU", which has the tools to make borders, type letters and numbers, and choose Disney clip art characters and other items to make your sign.

5. Experiment with each of the Design Menu items. For example, highlight the rectangle with the Disney characters on it and press Return. Then choose the picture you want, flip or cut it, and then place it somewhere on the work area. Choose several different Disney characters and objects, and then place them on your sign.

You must add some words and letters to your sign. Choose the rectangle with the ABC on it and press Return. Pick a "font": size and style of writing and then type what you want on your sign.

There are other items on your Design Menu to experiment with. You have a rectangle for "Borders", one for "Moving" items on your sign, one for "Erasing", one for "Trashing", one for "Printing and Saving", and one for going back to the previous menu.

PLEASE REFER TO THE INSTRUCTION MANUAL STARTING WITH PAGE 31 WHEN YOU NEED HELP WITH YOUR EXPERIMENTAL SIGN.

6. STUDENT ASSIGNMENT: After experimenting with making a sign, I want each of you to make your own sign, save it to the included DATA DISK, print it (the setup is ready for your computer), and then hand it in to be graded. PLEASE WRITE YOUR NAME ON THE BACK OF YOUR SIGN AND ALL OTHER ITEMS YOU MAKE WITH CARD AND PARTY! Each of you (if you have a partner) should make: 2 SIGNS, 1 INVITATION, 1 AWARD, and 1 BANNER.
PUBLISH IT!2 (DESKTOP PUBLISHING): PROBLEM SOLVING SOFTWARE UNIT

PUBLISH IT!2 PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIEUP)  

PUBLISH IT!2: —NOTE: Work with your teacher for awhile to get started!

1. Carefully put the 3.5" disk Publish It!2 into the IIgs 3.5" drive and press Open Apple, Control and Reset to “Boot” up the disk.

2. After several moments, a screen with pull-down menus across the top, tools across the left side, and a work area will appear on the screen.

3. By using the manual and with a little help getting started from your teacher, you will take at least 2 class times to learn the beginning desktop publishing skills for Publish It!2. You should learn to think about what you want to do, try various menus or tools from the tool box to help you, and don’t be afraid to try things. Try to think and act as a team to solve problems you come across while working with Publish It!2.

4. STUDENT ASSIGNMENT: EACH MEMBER of your group should have a turn to create 2 signs/awards. Make sure one of them has a picture (graphic) on it as well. Your data will save onto the 3.5" disk and the printer set up has been taken care of for you. Print out a copy of all of your creations and SIGN YOUR NAME ON THE BACK before handing it in. Good Publishing!!
KOALA PAINTER (with Koala Pad):  PROBLEM SOLVING SOFTWARE UNIT

KOALA PAINTER PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIENUP)

KOALA PAINTER (with Koala Pad):  (Have your teacher connect the Koala Pad)

1. After getting the Koala Pad connected to your Apple IIgs computer, load the Koalapainter disk. The KOALA PAINTER title screen will appear. Press either button on the KoalaPad to continue. You should be at the main Koala Painter menu.

2. You will use the STYLUS (plastic pencil) on the Koala Pad and the 2 buttons on it almost all of the time while working on this disk. You will rarely use the keyboard. Press either button now. This will take you to your work screen where you will create your picture. Press either button again will take you back to the Main Menu.

3. From here, touch the Koala Pad with your Stylus. A cursor appears on the screen. Moving around the Stylus will move the cursor all over the screen. Try this now.

4. You will need to pick a brush to use from the BRUSH SET on the Main Menu. Here’s how: Take the Stylus and move it around on the Mouse Pad until you are on top of the brush you want. Then PRESS one of the 2 buttons on the Koala Pad. You have now picked a brush. You pick colors and different objects the same way off of the Main Menu. The small, white triangles show you what 3 items are currently in use on the Main Menu.

5. Next, press one of the 2 buttons again on the Koala Pad. If you have a color, brush, and an object picked from the Main Menu, then you are ready to DRAW AND CREATE!!

6. On your blank work area, press the Koala Pad with the Stylus and while you are pressing with the Stylus, push the RIGHT button on the Koala Pad. You now can make something on the screen by moving the Stylus anywhere you want to on the Koala Pad. Try to make something now. CONGRATULATIONS!! When you lift the Stylus and press one of the buttons, you will return to the Main Menu. There, you can choose other colors, brushes and designs to use. (REMEMBER HOW?—Refer to #s 4-6 if you need to.)

7. Picking the rectangle "Storage" will take you a different menu used for saving your drawing. Make sure the CAPS LOCK key is down and type 'S'. Follow the directions to pick drive #1 and name your picture. MAKE SURE YOU PUT IN THE DATA DISK!!

8. STUDENT ASSIGNMENT: Using the manual, the above instructions, or by your own thinking and trial and error, your assignment is to create 3 different pictures using different tools, brushes and colors and then save them to the included data disk. Good Luck!!
THE DARK TOWER:

1. Insert the disk and read the instructions.

2. Copy down the list of commands you can use. (You will hand these notes in.)

3. Follow the instructions of the adventure. Your goal is to find the fortune without being killed.

4. IMPORTANT—You must draw a map of where you have been because you cannot save this adventure. You will have to finish during the next class, so remember what you’ve done and where you’ve gone.

5. Let me know when you have either died, found the gold, or have spent at least 2 class times working on “The Dark Tower” before you give up.

6. Be sure to hand in your map and notes. Keep the solution to the adventure OUR SECRET if you are successful!!!
HISTORY MYSTERY:

1. Insert the disk (side 1) and read all of the instructions carefully.

2. When you begin your adventure in the museum, use the ? (question mark) key to get a list of choices of things to do.

3. COPY DOWN THESE COMMANDS. You will use them and then hand them in when you are done with this adventure.

4. TAKE NOTES of items you need to remember while you are working with "History Mystery". You may want your partner to take notes and draw while you operate the computer. These notes will be graded.

5. DRAW a map of where you have been while in the museum. You will use this to find your way around. (Draw small; don’t use a lot of detail.) This will be graded as well.

6. Let me know if you die, find the hourglass, or have spent at least 2 class times working on this adventure. Good Luck!!
1. Insert the disk and load disk #1, side #1 and then flip to side #2. (Be sure to pick the program—Cosmic Heroes.)

2. Read all of the instructions carefully. Copy down what your "Trial Assignment" is on a piece of paper.

3. As you go through your adventure, write down all of your clues. They may come in handy later. You will hand your notes in.

4. Continue in your adventure. Get help when needed from the dog or the amulet.

5. Tell me when you have been defeated or destroyed, or when you have won. Let me see the ending screen. Hand in all of your notes to get credit for them.
1. Insert SIDE 2 of the disk into the disk drive and load Sound Lab. Carefully read and follow the directions!!

2. From the menu that appears on the screen, pick "Instructions" and press Return. There are 2 different sets of instructions: "Edit A Sound" and "Perform a Sound". Read through them both. Then press ESC to go back to the Main Menu.

3. Pick "Perform A Sound" from the menu and press Return. Then LOAD some sounds or press the ? (question mark) for help. After loading the sounds you want to use, then pick "Record" and create a song. After "Playing" the song you created, then you can make it fast or slow, press ESC to go back to the menu and then "Edit A Sound", or SAVE it to the included data disk.

4. Don't be afraid to try different things. Read or re-read instructions to get help, if needed, but don't be afraid of hurting anything.

5. Your ASSIGNMENT is to create sounds of several things, and then after playing and editing them, SAVE them to the data disk. (Follow Instructions!!) You must create, edit and save at least 4 different "Songs" with several sounds each. HAVE FUN—YOUR NEIGHBORS WILL ENJOY THE SOUNDS. I want to hear your results when you're through.
LIGHT ON TARGET:

1. Load Side #2-Light on Target and follow the instructions. You can read about light if you want to, but eventually play the game.

2. When you get to the game screen, you will see a hand with a finger pointing on it. Use the arrow keys to point to “Help” and press Return.

3. Follow the directions and move mirrors or semi-reflective glass to be able to hit the target with the lazer using the shortest possible route.

4. YOUR ASSIGNMENT IS: Solve at least 6 Puzzles and COPY down your scores to hand in. These will be graded. Good Luck!!
MYTHS OF OLYMPUS:

1. Insert the disk and choose "Myths of Olympus" from the menu. Read ALL of the instructions carefully.

2. Type in your real name(s).

3. Read and TAKE NOTES carefully!! There are special keys to push and things the gods tell you to remember in your adventure. You will hand in these notes to get graded.

4. Draw a map of the maze!! If you have a partner, have one of you draw and take notes while the other one operates the computer. (You will hand in your map to be graded.)

5. Let me know when you are successful. You will tell me how you were successful. If you fail, try it again.

6. If you run out of class time, you should be able to save your game if you carefully read the instructions.

7. Spend at least 2 class times on "Myths of Olympus", unless you are successful. Make sure you tell me of your success and hand in your map(s) and notes.
SHOW TIME: PROBLEM SOLVING SOFTWARE UNIT
SHOW TIME PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH–8TH GRADE STUDENTS—T. FIENUP)

SHOW TIME:

1. Load the disk, it takes awhile. Make sure your group has the manual and a data disk to accompany Show Time.

2. Follow the directions. You will need to think of a name for your production, pick characters, scenery and props for your play. I would recommend that each of you be one character in your play—that way, each of you will be involved.

3. With other options, such as adding music to your play, character movement, other acts and dialogue, it will take you several class times to work with and figure out how to create your play. Be sure you save it to your data disk.

4. It would be great that when you finish, you would show your play to the class. GOOD LUCK!!
MOUSEPAINT: PROBLEM SOLVING SOFTWARE UNIT

MOUSEPAINT PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIENUP)

MOUSEPAINT:

1. MousePaint is a drawing program that uses a mouse, a data disk (to save your drawings), and a printer. When you first load the disk, you should pick to go directly to MousePaint, since you probably have already worked with a mouse.

2. When you get to the “work” screen with the pull-down menus at the top and the tool boxes to the left and bottom of the screen, go up to the FILE menu and click on it. Then move the arrow down to “Blank Hi-Res Screen” and release the mouse button. This should blank your picture and allow you to begin drawing.

3. Use the mouse to click on and grab tools to the left or below to help you make your drawing. You can choose various colors and patterns below as well. You can draw, paint, spray paint and create designs on the screen. You can also erase or type in your work area.

4. When you first start, experiment with several different tools and pull-down menus. Don’t worry, you cannot hurt anything, but you may have to struggle and experiment for awhile in order to create your drawing the way you want it. You can always clear the screen after making a “mess”.

5. When you create a drawing that you like and want to keep, then go ahead and print it. THE PRINTER SLOT IS 1, when it asks you for it. Be sure you hand in at least 3 different drawings before going on to another disk. I have had trouble saving most drawings, but you can try to SAVE your work onto the data disk by using the FILE menu.

6. Good Luck and BE CREATIVE!!!
ZOYON PATROL: PROBLEM SOLVING SOFTWARE UNIT

ZOYON PATROL PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIENUP)

1. Carefully put side 1 of Zoyon Patrol in the disk drive and boot up the disk. After the "Title Screen", the disk will ask you if you would like an introduction to Zoyon Patrol. You should say 'Yes' unless you have used this disk before.

2. Carefully read through the introduction and the instructions. Either you or your partner should take notes THAT WILL HELP YOU LATER ON. When you are done reading the introduction, type in your REAL name(s) and press Return.

3. You are now ready to try Zoyon Patrol. Press #1 and pick the "Beginner Level". Follow the instructions.

4. Read the messages and get more information from them in order to get descriptions of what the Zoyon looks like so you can later identify it. After getting several descriptions of your Zoyon, you should try to identify it by pushing #2 from the main menu and following the directions.

5. After identifying the Zoyon, release the tracking animal, called a Lempel, and then try to set traps around the location of the Zoyon. (HINT—I always surround my Lempel with traps because it stays right with your Zoyon.) Eventually, you should capture your Zoyon.

6. If you capture the Zoyon, the computer should save your success onto the 'Hall of Fame'. If you run out of time, you can save your adventure to a data disk by picking "Quit" from the main menu and then following the directions.

***—YOUR ASSIGNMENT is to solve and save (to the Hall of Fame) 2 beginner level adventures
MECC: PUZZLES AND POSTERS—PROBLEM SOLVING SOFTWARE UNIT

PUZZLES AND POSTERS PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIEUP)

PUZZLES AND POSTERS:

1. Carefully insert the disk label side up into the disk drive and press Open-Apple, Control and Reset to 'Boot' it up. When you get to the Puzzles and Posters Menu with the programs and options on it, pick #5 and read the general information. Then if there isn't a data disk, pick #7, "Diskette Support" and create a data disk from one your teacher gives you.

2. Make sure that you save and print everything you make with Puzzles and Posters and then hand them in to be graded.

3. You and your partner will need vocabulary words from one or more of your classes before you can create word searches and crossword puzzles. You can use any subject, but if can't think of some words to use, use some from keyboarding class, or see your teacher for some help.

4. YOUR ASSIGNMENT with this disk is to create, save and print 2 different Word Searches, Crossword Puzzles, and A-Maze-Ment Mazes. Be sure you hand in your work to be graded.

5. I think you will find that all 3 programs are easy to do as long as you carefully READ AND FOLLOW THE DIRECTIONS! Use the Manual if needed. Good Luck!
SOLUTIONS UNLIMITED SERIES (8 disks): PROBLEM SOLVING SOFTWARE UNIT

SOLUTIONS UNLIMITED SERIES PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH–8TH GRADE STUDENTS—T. FIEKUP)

SOLUTIONS UNLIMITED (8 DISKS):

INTRODUCTION: Solutions Unlimited is a series of 8 disks (units) that help direct students to learn problem solving techniques while learning about various computer applications.

The student or student pair should have the opportunity to view a short videotape presentation that introduces each of the 8 units and accompanying disk. You can go through the disks in any order, by I recommend going through them in order.

The 8 units or disks (in order) are:

1. Hey Wait! Think, See, So?
2. Plan Ahead
3. The Whitewater Canoe Race
4. Letters From the Past
5. Saving Energy
6. Who Says So?
7. Do I Know Enough?
8. Survival

STUDENT ASSIGNMENT: Go through each disk in order. If the videotape is available, view it first before getting the disk. Have you and your partner take turns operating the computer and taking notes. Take notes to: A) Tell the instructor what you’ve done and how you have progressed and B) Help yourselves out with the problem at hand that the disk offers. MAKE SURE YOU HAND IN ALL OF YOUR NOTES WHEN YOU HAVE COMPLETED ALL 8 DISKS. It will take you several class times to finish, so take your time.
FLIGHT SIMULATOR II: (Use an Apple IIe with the Joystick)

1. Carefully put the Flight Simulator II disk into a 5.25" drive with an Apple IIe. Press Open Apple, Control and Reset to "Boot" up the disk.

2. Get out the Flight Simulator II manual and read pages 9-11. This will introduce your simulation disk and help you answer the first few questions.

3. Do "A Quick Test Flight" on the bottom of page 11 and all of page 12. Show your teacher when you have "crashed".

4. Use the next few class times to learn how to: Taxi, Take-off, Maneuver, and Land your aircraft. You should read and work through pages 13-44 in your manual. Your teacher will observe your progress as you work. Let him watch you flying your aircraft from time to time. If you have a partner, please take turns operating the plane. When you feel you have earned your "Pilot's License", contact your teacher. Happy Landings!!!
DAZZLE DRAW: PROBLEM SOLVING SOFTWARE UNIT

DAZZLE DRAW PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIEJUP)

DAZZLE DRAW:

1. Take out the Dazzle Draw disk and carefully insert it into the disk drive and press Open Apple, Control and Reset. The disk should load into the computer.

2. After looking at the title screen, the disk will automatically go to another screen that will ask you to select your input device and file system and other set up questions. ALL YOU HAVE TO DO IS PRESS 'GO' TO PROCEED: YOUR TEACHER HAS EVERYTHING SET UP ALREADY FOR YOU. A mouse, data disk and printer are required to work with this disk. See your teacher if you need any of these.

3. To use Dazzle Draw you must also be CREATIVE and be willing to try things (some may work and some may not work). Do not be afraid of ruining your screen. You can always start a new picture. "Play around" with the tool boxes and pull-down menus for awhile—that is how you learn sometimes!!

4. You will STRUGGLE from time to time with this disk. I want to see how well you can solve problems and use your own thinking (and your partner's) to do the following assignment.

5. STUDENT ASSIGNMENT: **—OVER SEVERAL CLASS TIMES—**
   A) Become familiar with how the mouse, pull-down menus and tools work with Dazzle Draw. Refer to the manual when you are stuck. SEARCH AND READ!!!!
   B) Once you have a pretty good idea for what is going on with Dazzle Draw, I want you to create, save and print at least 3 completely different pictures using many different "Tools" and "Goodies" from those pull-down menus.
   C) Hand in these pictures/scenes with a cover page created by Dazzle Draw that includes your names and "Computer Applications" on the cover. That's a total of at least 4 hand-outs to be turned in.
FANTAVISION: PROBLEM SOLVING SOFTWARE UNIT

FANTAVISION PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIEHUP)

FANTAVISION:

1. Take out the FANTAVISION disk and carefully insert it into the disk drive and press Open Apple, Control and Reset. The disk should load into the computer.

2. After viewing the 'Title Screen', the disk will automatically load the Fantavision Work Screen and wait for you to work!!

3. Take the "Quick-Start Card" out of the box and do the STEP-BY-STEP Directions that are there. Read and follow the directions carefully. You should have produced a short Fantavision movie with 3 "scenes".

4. When you are done with your first "movie", then take out the disk and flip it over. Re-boot the disk and it will show you a self-running "Movie Matinee" of a few things you can make with Fantavision.

5. When you've seen enough samples, flip the disk over again, re-boot it and get back to the Fantavision screen. Then get out the manual.

6. Read and use the manual to really dig into how Fantavision works. When you get to the work screen, try doing various things with the pull-down menus and tools that are located to the left and at the bottom of the screen. Put in the data disk and load one of your teacher's samples if you need to.

7. STUDENT ASSIGNMENT: Use the manual and Fantavision disks to create and SAVE your own mini-movie. If you have a partner, take turns creating 2 mini-movies.

***—You may have to experiment, start over, try different tools and menus, and above all, READ THE DIRECTIONS on the quick reference card and MANUAL. Keep trying. I know you can read, follow the directions, and think. Good Luck!!!
MINER'S CAVE (3.5" disk): PROBLEM SOLVING SOFTWARE UNIT

MINER'S CAVE PROJECT CARD—PLANS AND SUGGESTIONS FOR USE
(6TH-8TH GRADE STUDENTS—T. FIEUP)

MINER'S CAVE:

1. Load the disk by placing it into the 3.5" disk drive and pressing Open Apple, Control, and Reset. After a few moments, you will see the Miner's Cave main menu.

2. First, pick "Information" and press Return. Read "About Miner's Cave" first. WRITE DOWN ON PAPER the terms FORCE, LOAD and MECHANICAL ADVANTAGE and in your own words, define them before you finish working with this disk. Then WRITE DOWN all 4 of the simple machines that you will use to play Miner's Cave.

3. Next, pick "See How the Machines Work" and look at all 4 of the machines in action. (You may want to copy down all of the formulas to refer to later.)

4. Press ESC to go back to the main menu. Choose to be "An Apprentice", type your name(s) and press Return. Use your actual name(s). This will give you practice using the simple machines to load treasures out of the mine. Please take turns operating them.

5. When you return to the main menu, choose to be a "Master Miner". Again, use your correct name(s) and read the instructions. Go through a full work shift. If you make the "Hall of Fame" I will see your score. If you don't make the "Hall of Fame" copy down your score.

6. STUDENT ASSIGNMENT: Play the "MASTER MINER" at least 2 times per each member in your group. You can help each other, but only the person operating the computer gets to decide for each problem. Copy down all scores and turn these in with your notes when you are finished with "Miner's Cave". Try to beat my scores on the Hall of Fame. Have Fun!
FACTORY: After booting up this disk, you will see a main menu with:
1) Test a Machine
2) Build a Factory
3) Make a Product

Number 4, "Descriptions", will tell you what each program will do.
"Test a Machine" will show what PUNCH, ROTATE, and STRIPE will do to each piece of "raw material".
"Build a Machine" will set up an assembly line using the machines. The students can then watch the assembly line produce a product. Then they can challenge a friend to make a product.
"Make a Product" will show a final product on the screen that the computer made. It is the students' job to duplicate the product starting with their raw material and building a factory with the assembly line. When they think they have built it, the students will send their raw material through the assembly line (factory) they have built and see if they have indeed duplicated the product. There are 3 levels of difficulty here.

STUDENT ASSIGNMENT:
1. Load the disk and choose "Descriptions" from the main menu.
2. Then choose "Test A Machine" and follow those instructions if you have never worked with "FACTORY" before.
3. Pick "Build A Factory" from the main menu then and become more familiar with how your Factory works. Have partners take turns making a product and then challenging each other on how to reconstruct it.
4. When you feel you are ready to go on, pick #3, "Make A Product" from the main menu. As a partnership take turns or better still, work together and "bounce ideas" off of each other as you challenge the computer.
5. You must SUCCESSFULLY duplicate 3 computer-made products from EACH level of difficulty, DRAW the finished products, and hand them in before you can pick a different problem card and software package.
KING'S RULE:

When you first boot the disk, there are 6 levels of difficulty to choose from.

For each level you must solve 3 riddles to pass through that level and go to the next level.

Each riddle has 3 numbers that follow a rule (ie...The 3 numbers may be 2, 4, 8). Then you can test each possible rule that you think of by typing in 3 other numbers that fit your rule. The computer will tell you if they fit the rule or not and save trial sets of numbers to compare to other sets of numbers that you use. These lists can be seen on the screen. In the example, 2, 4, 8 may be even numbers, numbers that increase, the first number times the second number equals the third number, or a lot of other rules. When you think you know the rule you type Q (for quiz) and see if you are successful.

After you pass 3 quizzes for 3 riddles, then you pass on to the next level. The levels get more difficult as you go.

When introducing this disk to the students, use the Telex (Liquid Crystal Projection Device) and do the first 1-2 levels until they understand how the disk works. Then let them use the disk on their own.

STUDENT ASSIGNMENT: Work through the disk until you get to the sixth level and then try that one. Make sure you show me how far you've gotten after each class (you may want to record which level you're on). It may take 2 or 3 classes to complete this disk.
SUNBURST SOFTWARE: PROBLEM SOLVING SOFTWARE UNIT

BLOCKERS AND FINDERS PROJECT CARD—WITH PLANS AND SUGGESTIONS FOR USE (6TH-8TH GRADE STUDENTS—T. FIEHUP)

BLOCKERS AND FINDERS:

1. After booting this disk, you should read the "Descriptions" off of the main menu. Briefly, Blockers and Finders has 3 search games on a 4 by 4 grid. In each game 1 to 12 "Blockers" are hidden and your job is to find them all. The 3 difficulty levels from easiest to hardest are:
   1. Tilties levels—Finders are deflected 90 degrees, much like a mirror deflects light, when they meet a Tiltie.
   2. Arrows levels—Finders move in the direction of the Arrow when they meet one.
   3. Detours levels—Finders go off in one of several different directions when they meet a Detour.

2. STUDENT(S) ASSIGNMENT: After becoming familiar with the Blockers and Finders disk, each student partnership or individual student should:
   A) complete 2 Tiltie Level screens. You must complete 1 screen from each of the 3 difficulty levels.
   B) complete 2 Arrow Level screens. You must complete 1 screen from each of the 3 difficulty levels.
   C) complete 2 Detours Level screens. You must complete 1 screen from each of the 3 difficulty levels.

****—A TOTAL OF 6 DIFFERENT SCREENS/PROBLEMS IN ALL!

****—WHEN YOU SUCCESSFULLY COMPLETE EACH SCREEN, DRAW IT!!

YOU WILL TURN IN ALL 6 DRAWINGS WHEN COMPLETED WITH BLOCKERS AND FINDERS.
1. After booting this disk, read and follow the instructions.

2. Pick #4 off of the menu-"Read Directions First".

   **-On a sheet of paper write down what a program is and copy down what the 3 commands to move Algernon (the mouse) are.

3. Choose and do "Learn" off of the main menu.

4. Do both the EASY and HARD parts of "Learn".

5. Then choose and do "Plan" off of the main menu.

6. Again, do both the EASY and HARD parts of "Plan".

7. Then choose "CHALLENGE" from the main menu.

8. Do the EASY, HARD, and try the "HOMEMADE" parts of "Challenge".

   ****-Write down and hand in all of your scores on paper.
PUZZLE TANKS:

1. After booting up the disk, type in your actual name(s).

2. Read the "Descriptions and Instructions" carefully.

3. Do 1-3 "Puzzles" at the "Beginner Level" correctly and record your results. Take down notes and write down the number of tries.

4. Do at least 3 problems at the "Expert Level" correctly. Again, write down your results.

5. Do at least 3 problems at the "Grand Master Level" correctly. Again, write down your results.

6. Solve (or try to solve) 1 problem at the "Champion Level" and get your name on the "Hall of Fame" which is saved onto the Puzzle Tanks disk. (See your teacher if you're having a LOT of trouble solving a problem.)
1. After booting this diskette, pick "Instructions" off of the main menu, and read and follow them.

2. STUDENT ASSIGNMENT: You (and your partner) must complete at least two "Novice" puzzles to get credit for this disk.

3. Take good notes or draw the monsters that you make on the screen. You must hand in these notes when you finish working with Incredible Lab.

4. When you feel that you have solved a puzzle, then take the CHALLENGE and then show me the screen to show me the results.

5. REMEMBER: Match the five body parts with the five chemicals that make each part.