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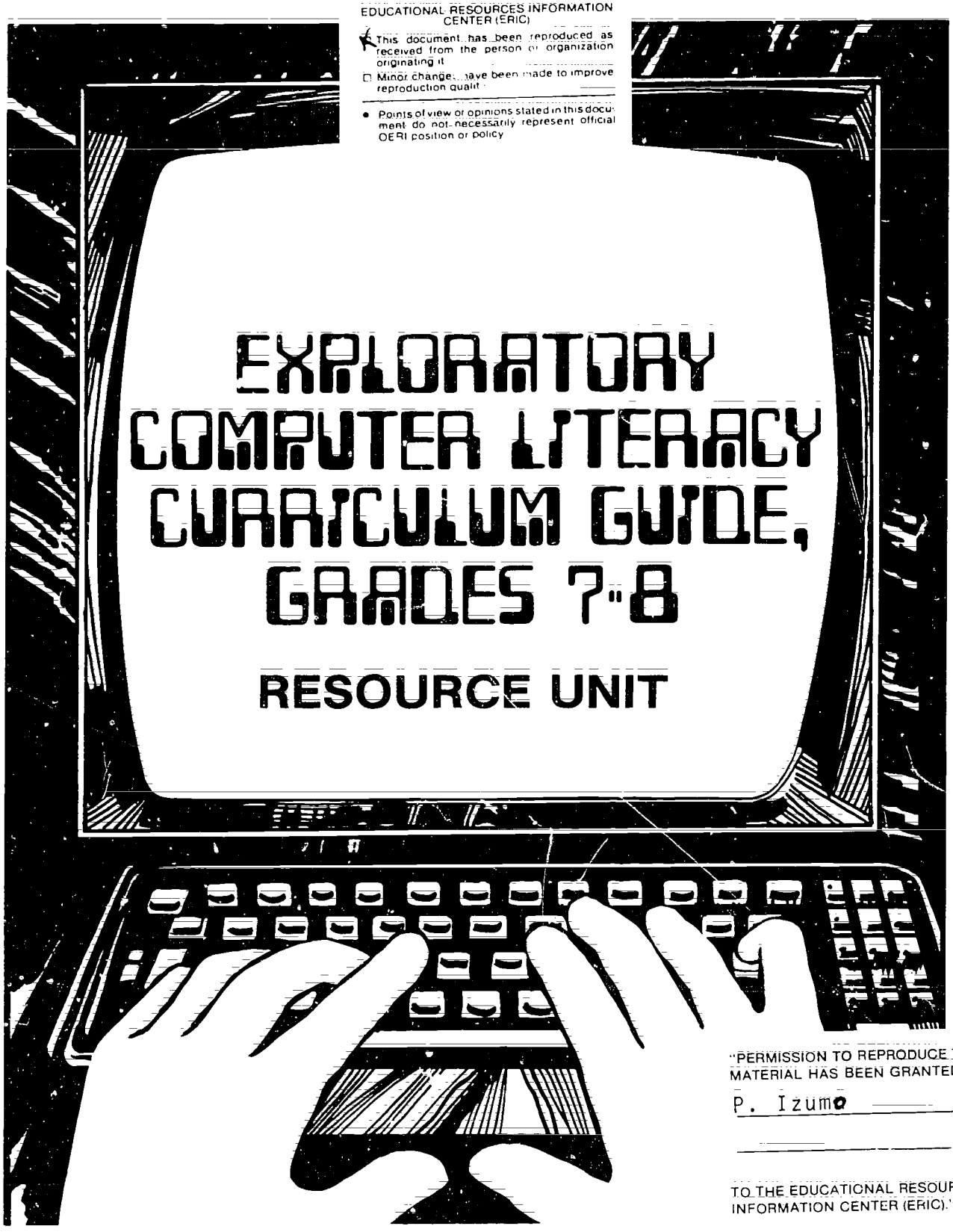
ABSTRACT

This resource unit, an addendum to The Exploratory Computer Literacy Curriculum Guide, Grades 7-8, is designed to provide teachers with guidelines and classroom computer activities for integrating computer literacy into the curriculum. An overview of the guide is given in the introduction, which notes that the materials reflect the teacher-developers' own environment variables such as school size, student characteristics, accessibility to microcomputers, and teaching style. A section on classroom management offers suggestions for effective curriculum implementation and addresses the operation of the computer laboratory, classroom demonstrations, use of the computers, diskette management, and copyright laws concerning microcomputer software. A broader perspective on implementation within the total school setting is provided in a section on integrating the computer literacy program into the curriculum, which addresses such topics as administrative support, a school computer coordinator, schoolwide planning and cooperation, and resources and faculty workshops. Five models are proposed as alternatives for delivering computer literacy instruction in the secondary schools. Sample activities are provided for the language arts, mathematics, science, and social studies, each of which includes course content objectives and guidelines in the following categories: subject, student expectations, instructional mode, prerequisites, classroom management, materials, activity time, teacher preparation, and sequence of activities. Resources include lists of recommended software and additional teaching aids. (DJR)



EXPLORATORY COMPUTER LITERACY CURRICULUM GUIDE, GRADES 7-8

RESOURCE UNIT

OFFICE OF INSTRUCTIONAL SERVICES/GENERAL EDUCATION BRANCH ☐ DEPARTMENT OF EDUCATION
STATE OF HAWAII ☐ RS 86-9845 ☐ JUNE 1986

The Honorable George R. Ariyoshi
Governor, State of Hawaii

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FOREWORD

This Resource Unit is designed to provide teachers, using the Exploratory Computer Literacy Curriculum Guide, Grades 7-8, with guidelines and additional classroom computer activities for integrating the exploratory computer literacy program into the curriculum. These activities were developed by local teachers in the areas of language arts, mathematics, science and social studies. As with the earlier sample activities found in the guide, these instructional units are only "starting points" from which teachers can expand into their own approaches, using their own ideas and creativity.

We hope that all intermediate teachers and principals will find this resource useful in implementing exploratory computer literacy programs in their classrooms and schools.

Francis M. Hatanaka

Francis M. Hatanaka, Superintendent

ACKNOWLEDGMENT

The Resource Unit, an addendum to the Exploratory Computer Literacy Curriculum Guide, Grades 7-8, is a composite of contributions from seven secondary teachers who have developed the activities to meet the needs of their particular subject area and student enrollment. In addition, ideas for some activities have been incorporated into the addendum from specific resources; appropriate credit has been given. The teacher contributors are:

Karen Arincorayan	Waianae Intermediate School
Barbara Higa	Waianae Intermediate School
Lucas Matsumoto	Moanalua Intermediate School
Richard Oyama	Waipahu Intermediate School
Carolyn Yoshida	Waipahu Intermediate School
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TABLE OF CONTENTS

INTRODUCTION

As schools develop plans and programs to meet the challenge of providing computer experiences for their students, teachers and principals have requested the sharing of implementation strategies and available resources. This resource unit is part of a continuing effort towards coordinating the sharing of teacher-developed materials in computer literacy. It should be noted that the paging of the Resource Unit is designated with an 'R' preceding the page number in order to distinguish this unit from the Grades 7-8 Guide.

The materials reflect the teacher-developers' own environments. Variables include size of school, characteristics of student population, accessibility to microcomputers and teaching style. Following the format of the sample activities in the Grades 7-8 Guide, the sample activities in this Resource Unit are intended to provide additional models for what can be done in the subject areas of language arts, mathematics, science and social studies. Teachers and principals using these materials will need to modify the examples to accommodate their own classroom or school situation.

The section on Classroom Management offers suggestions that the teacher-developers of the sample activites have found conducive to effective implementation of exploratory computer literacy. The following section on Integration of Exploratory Computer Literacy into the Curriculum provides a broader perspective on program implementation within the total school setting.

For each of the subject areas of language arts, mathematics, science and social studies four or five sample activities are provided. Each sample activity includes guidelines for teachers in the following categories:

Subject
Computer Literacy Student Expectations
Instructional Mode
Prerequisites
Classroom Management
Materials
Time for Activity
Teacher Preparation
Sequence of Activities

The suggestions and guidelines describe one way to conduct the activity. Depending on differences in the availability of microcomputers, where they are located in the school, class size, teaching styles and student background, the activity will have to be modified. Each sample activity is intended to serve as a suggestion based on the experiences of the teacher-developer, not as a prescription or formula for all to follow.

A list of software appropriate to the exploratory computer literacy curriculum has been compiled based on recommendations from the teacher-developers and state educational specialists. Specific teaching aids beyond those provided in the guide are also included in this resource unit.

It is expected that teachers using both the guide and this resource unit have received training in the use of computers in education. Minimum training equivalent to Phase II of the Department of Education's inservice training model is assumed. This model for Phase II can be found in the Computers in Instruction: Framework for Administrators, Appendix E, pages 12-16.

Computer Lab

Ideal facilities are a computer lab and an adjoining classroom. Each computer period should begin in the classroom with discussion and directions. The lab should then be used for specific hands-on activities. The secured lab should have a sufficient number of microcomputers to allow two students per machine. However, a ratio of three students per computer is often manageable and may be preferable in some situations where an advanced student tutors beginning users.

Where the teacher has a three per machine ratio, he/she should emphasize the need for teamwork. Students not keyboarding should be actively participating in the lesson and rotated at least once every period. When the teams are expected to identify themselves on paper, they should list the team leader (computer operator for the start of the period's work, sitting in middle position directly in front of the keyboard)...first. The student sitting on the left of the leader can become the reader of manuals and instructions and be listed second. The student on the leader's right can become the secretary and recorder for the team and be listed third. With this arrangement, it is important to stress the need for each team member to assume the duties and responsibilities of each of the three computer positions: Operator/Leader, Reader/Librarian, and Recorder/Secretary. With a fair rotation of positions during the period, each team member should have approximately the same amount of time as computer operator.

General rules for the computer lab must be established before the first day of use. These should include provisions to protect hardware and software, and to maintain class integrity. Hardware protection should preclude foods or liquids in the lab. Science labs that incorporate computers in experiments using liquids must take extra precautions for this arrangement. Software protection should include provisions against borrowing, unauthorized copying and physical damage. When brief lecture periods are required in the lab, it may be necessary to turn off all monitors to get students' attention.

Posters dealing with the care and handling of both hardware and diskettes along with the reference charts for the various software programs can be displayed on bulletin boards within the computer lab. There should be adequate desk space around each microcomputer for students to record screen data or on which to place prepared materials for keyboard entry.

Classroom Demonstrations

Only one computer is required, but at least one large monitor and/or several regular monitors or a video projector will be needed for the classroom environment. Whenever possible, a student should do the actual keyboarding, and the full class should be solicited for input to the program. Teams may be formed for data input or evaluation. Demonstrations are especially appropriate for introductions to and overviews of assignments conducted in the computer lab.

Classroom Computers

If one or more microcomputers are available in the classroom, sign-up sheets and assigned sessions should be provided to ensure that every student has equal access to the machines. Strict rules for computer use and against computer abuse must be stressed and monitored. Posters listing the rules for computer care and other relevant topics should be displayed where appropriate.

To reduce computer associated noise during class periods, the speaker may be disabled. Printing assignments may be delayed by storing to disk, or printers may be isolated in sound damping containers, which also offer improved security.

To maximize use, computers should be available to both students and other staff members during non-instructional periods. Computer clubs and special interest groups can offer opportunities for both advanced and beginning computer users to develop skills.

Diskette Management

To ease diskette management, an area in the lab or classroom should be set aside for the storage of diskettes. Each computer should be labeled, and the diskettes used should have corresponding labels. A system should be devised for students to go to a designated area in the lab to pick up their student data diskettes as well as the program diskette being used that period. At the end of the period, students should return their diskettes to the designated place. The teacher should be able to see at a glance if all the diskettes have been returned.

Copyright Concerns

Ambiguity in the copyright statutes and their application in educational media have plagued educators for several decades. With the tremendous growth in the use of microcomputers in schools during the 1980s, attention has focused on the copyright law as it pertains to microcomputer software. Unlike some areas affected by the copyright law, microcomputer software copyright protection lacks case law precedent, so interpretation of the law contains many unresolved issues. Even though different sources vary in their interpretation of the copyright law, the vagueness of the law as it applies to microcomputer software and the lack of case law precedent should not be viewed by educators as a loophole to allow unauthorized copying of microcomputer programs.

Currently there are only two permissible instances in making fair use copies of software:

1. That only one backup copy is made from the master copy and that it is created as an essential step in the utilization of the computer program in conjunction with a machine; it cannot be used to program more than one machine at a time; and

2. That such a copy is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

Despite the good intentions of teachers, copies made of copyrighted software by teachers for classroom use are currently not legal nor ethical. All DOE employees are expected to adhere to the copyright law.

In attempting to lower costs for educators, publishers are more frequently providing class sets of a software item at a reduced price.

INTEGRATION OF THE EXPLORATORY COMPUTER LITERACY PROGRAM INTO THE CURRICULUM

For effective implementation and successful integration of the Exploratory Computer Literacy Program into the general curriculum, there are several major considerations that must be addressed: administrative support, leadership of a teacher appointed by the principal as the school's computer coordinator or a computer committee established by the principal, school-wide planning and cooperation, resources and faculty workshops. Any successful educational program requires the school principal to perceive his/her role as an instructional leader in addition to an administrative leader. This particular program needs his/her support for computers to be integrated into the curriculum. Guidelines to administrators in planning their school efforts for implementing the computer literacy program are provided in the Computers in Instruction: Framework for Administrators guide.

Another primary consideration is the appointment by the principal of a teacher, interested and capable, as the school's computer coordinator or the establishment by the principal of a school-wide computer committee, which would appoint a committee chairperson. With recommendations from other interested teachers, the computer coordinator/committee needs to establish a plan of action that the school will follow in integrating exploratory computer literacy into the general curriculum. The Task Force on the Delivery of Computer Programs at the Secondary Level proposed five models as alternatives for delivering exploratory computer literacy in the secondary schools. (Refer to the Grades 7-8 Guide, the section titled Implementing the Exploratory Computer Literacy Program, pages 13-14.) These alternatives should be helpful in determining which method of program delivery is most appropriate for the school.

Of these five models, the first, an elective one-semester course, is now established in The Foundation Program's Authorized Courses and Code Numbers (1986-1988), page BB-4. A course guide will be available by September of 1986 for the development of this grade 7-8 one-semester course, Introduction to Computing.

The second model, a unit within a content area course, can be delivered as a four- to eight-week session through a selected content area, such as Language Arts. With this alternative all students at one or both grade levels can be serviced in one school year. The actual length of the session, the number of students enrolled and the number of microcomputers available in the computer lab would determine if one or both intermediate grade levels could be serviced in one year. Time constraints, however, limit full exposure to all student expectations in the Exploratory Computer Literacy Program.

The third model, a shared computer lab or resource center among several content area courses, can involve a greater variety of computer applications and cover a wider range of topics in the Exploratory Computer Literacy Program. With two- to three-week sessions offered in Language Arts, Mathematics, Science and Social Studies, all students could be serviced in one or more, but not all, subject areas. However, careful coordination among the departments involved in the program is a critical

factor in the success of this model. A master schedule to accommodate the computer needs of these departments must be established prior to the school year by the involved teachers with the assistance of the school's computer coordinator/committee.

The following charts summarize the differences between model #2 and #3 in delivering the Exploratory Computer Literacy Program in the subject areas. They illustrate the contrasts in integrating the program in one versus four subject areas.

Exploratory Computer Literacy Content Areas	Subject Areas			
	Lang.Arts	Math	Science	Soc.Studies
MODEL #2				
History/Evolution of Computing	x			
Computer Operations/Functions	x			
Keyboarding	x			
Computer Tool Applications (Word Processing, Spreadsheets, Databases, Graphing Data)	x			
Computer Impact, Values, Ethics	x			
Computer Careers	x			
MODEL #3				
History/Evolution of Computing			x	
Computer Operations/Functions		x		
Keyboarding/Word Processing	x			
Spreadsheets		x	x	
Databases				x
Simple BASIC Programming		x		
Graphing Data			x	
Computer Impact, Values, Ethics				x
Computer Careers	x			

In integrating the Exploratory Computer Literacy Program, the school's computer coordinator/committee and interested subject area teachers must assess the needs of their courses and determine if and where appropriate computer literacy activities would enhance their curriculum. These same teachers, under the leadership of the school's computer coordinator/committee, should then meet as a group to:

1) identify the delivery strategies to minimize duplication of effort and maximize concept development and reinforcement among teachers, grade levels and subject areas;

2) devise a master schedule and long-range plans for implementation of instruction using computers; and

3) establish rules for computer lab usage.

Another primary concern is the availability and acquisition of resources (hardware, software, funds, facilities), which requires both strong validation by the school's computer coordinator/committee and full administrative support.

The need for school-wide coordination and cooperation in integrating the Exploratory Computer Literacy Program within the curriculum cannot be over-emphasized. The school's computer committee should make provisions to conduct faculty workshops for sharing ideas and training others who want to explore instructional computing. As more of the faculty get involved with the program, the planners (and newcomers) can work together in developing plans for an expanded program and further purchases of hardware, software and other teaching materials.

It is the intent of this Resource Unit to provide guidelines and additional sample activities for integrating the Exploratory Computer Literacy Program within the curriculum areas of language arts, mathematics, science and social studies. Such integration is only possible when the activities reinforce both the course content objectives and the student expectations for Exploratory Computer Literacy.

SAMPLE ACTIVITIES

Sample Activities. The suggested sample activities on the following pages support the goals, objectives and student expectations of the Taxonomy, located in the Grades 7-8 Guide, pages 19-21. These activities provide teaching strategies for introducing certain concepts or developing specific skills in exploratory computer literacy. They are not intended to be the only method of presentation but are instead "starting points" from which teachers can expand into their own approaches, using their own ideas and creativity.

Subject. The sample activities have been developed for the subject areas of language arts, mathematics, science and social studies.

Computer Literacy Student Expectations. The computer literacy student expectations listed for each sample activity have been condensed. For a complete statement of the student expectations, refer to the Grades 7-8 Guide, the Taxonomy of Goals, Objectives and Student Expectations for Exploratory Computer Literacy in the section titled Curriculum Guidelines, pages 17-31. Some of the student expectations will be introduced in the various activities, while others will be reinforced, having been initiated at an earlier grade level. The Scope and Sequence Chart, in the same section as mentioned above, illustrates where, when and how these student expectations are best considered.

Instructional Mode. The major mode or method of instruction is indicated for each activity. Some activities suggest more than one mode. It is at the discretion of the teacher as to what modes seem most appropriate for his or her circumstances. Refer to the discussion on these modes in the Grades 7-8 Guide, the section titled Curriculum Description, pages 11-13.

Prerequisites. Many of the sample activities expect a certain level of experience from the students. In several cases, a reference is made to other activities from either the Grades 7-8 Guide or the Resource Unit.

Classroom Management. The concerns for classroom management, found in the sample activities, include the number of microcomputers available to the teacher and the location of these machines. A microcomputer for classroom demonstration purposes should have a large-screen monitor. If the entire class cannot attend the computer lab in one session, the teacher many need one or two assistants to either maintain order in the classroom while he or she is in the lab or to help out in the lab while he or she remains in the classroom. Volunteer help from parents, colleagues or student-teachers may be a convenient solution. Reliability of volunteer help, however, may become a problem. A more realistic approach would be to train two to three students in each class who are more "computer literate" and willing to take on special responsibilities to help you. Rewards could include bonus points, extra computer time or the additional knowledge and experience gained by this opportunity. Students should prepare their lab exercise on paper before entering the computer lab.

Materials. A number of resources (with specific page numbers) are suggested as possible background reading for the teacher and text material

for students. Because the material is geared toward Apple equipment, some adjustments may be needed in the activities for other brands of microcomputers. Materials written for other brands of computers are included in the Teacher References located in the Grades 7-8, pages 155-156.

Time for Activity. Only an approximate time period for each activity can be suggested, since numerous variables, such as number and location of available microcomputers, number of students, range of computer skills among the students, length of classroom period and other classwork assigned are involved.

Teacher Preparation. Implementing the Exploratory Computer Literacy Guide, Grades 7-8 does require the teacher to plan in advance. Orders for particular software can take from one to two months. It is important to run through an entire tutorial program or experiment with a tool or utility program (as word processing) prior to any classroom activity. Keeping an eye out for current articles related to computer applications will prove most helpful.

Sequence of Activities. This last category in each sample activity enumerates the actual steps or procedures that a teacher can follow to make the total activity an effective learning experience.

SAMPLE ACTIVITIES
LANGUAGE ARTS

17

LANGUAGE ARTS COURSE CONTENT OBJECTIVES

At the intermediate school level two one-year courses, English (Grade 7) and English (Grade 8) are required. Within the Language Arts Basic Program five areas of emphasis have been identified: oral communication, reading, writing, language study and literature. These five areas are fundamental to helping students develop their oral and written language abilities and respond to the language of others; showing students the enjoyment and power which derive from effective language use; and increasing students' ability to think, organize ideas, make decisions, problem solve, and interact in a variety of communication situations. In addition, these five areas contribute to the enlargement of experience, the clarification of values and the nurturing of the imagination. The instructional approach used at the intermediate school level is to relate the course content and skills to personal and interpersonal needs and interests of students.

The five areas of emphasis in the Basic Program support the overall goals of the Secondary Language Arts Program, which are to develop in students the following:

1. The highest degree of informed control over their use of language of which they are capable.

2. Increased understanding of the nature and structure of the English language within a broad perspective of communication.

3. An enriched understanding of literature.

Of the Language Arts course content objectives delineated in The Foundation Program's Authorized Courses and Code Numbers (1986-1988) for the Basic Program, (page E-5), six in particular are addressed by the following sample activities. The chart below summarizes the course content objectives reinforced by the activities.

Course Content Objectives	Sample Activities #1	#2	#3	#4
English, (Grade 7)				
2. Understand elements, processes and functions of communication systems.	x	x	x	x
3. Understand central ideas explicitly stated in oral and written texts.		x	x	
4. Understand and use appropriate conventions, language and organizational patterns in speaking and writing for varied purposes and audiences with emphasis on expressive and informative in personal and interpersonal situations.	x	x	x	x

Course Content Objectives	Sample Activities #1	#2	#3	#4
English, (Grade 8)				
1. Understand and appreciate short story and non-fiction as literary forms.	x			x
3. Understand central ideas of oral and written texts by structuring data/information given.		x	x	
4. Understand and use appropriate conventions, language and organizational patterns in speaking and writing for varied purposes and audiences, with emphasis on expressive and informative in small group situations.	x	x	x	x

SAMPLE ACTIVITY #1
Word Processing and a Class Newspaper

Subject:

Language Arts - Writing

Computer Literacy Student Expectation(s):

1.1.1. Recognizes computer instructions
1.1.2. Reads instructions, keyboard, output
1.1.3. Uses control keys/commands
1.1.4. Selects/Uses written resources
1.1.5. Experiments as a user
1.1.6. Responds to error messages
1.5.1. Seeks work/play with computer
1.5.2. Uses positive affect words
3.2.1. Identifies applications
4.2.1. Describes how computers assist people

Instructional Mode:

Tool/Topic

Prerequisite(s):

Students should be familiar with the operation of the microcomputer and be able to use the keyboard comfortably. Students should have already prepared two essays: 1) a minimum of two paragraphs; 2) a one-page news article.

Classroom Management:

A lab setting with two students per computer is recommended. For classroom demonstrations there should be one microcomputer with a large monitor or a network system. One or two printers should be available. If only one or two copies of The Newsroom is available, students will have to sign up for computer time on a rotational basis.

Material(s):

Microcomputers and printers.
Word processor software and manual, such as:
AppleWriter, Milliken's Word Processor, Bank Street Writer, PFS: Write, Superscripsit, C64 - Wordprocessor, etc.
The Newsroom program by Springboard.
Blank Diskettes.
Teacher-made handout: Word Pr[illegible] and Sample Essay. (A sample is provided.)

Time for Activity:

Five to ten class periods; one class [illegible]monstration for every two to three work sessions.

Teacher Preparation:

Become familiar with the word processing and Newsroom programs and accompanying manuals.

Prepare a demo file with a paragraph containing errors. If possible, train one or two students as your assistants in demonstrations and as consultants to other students. Initialize as many blank diskettes as there are machines. Copy demo file on each diskette. A sample essay follows this activity.

Sequence of Activities:

Word Processing

1. Explain what a word processor is and discuss the advantages over a typewriter.

2. Distribute the handout for Word Processing and Sample Essay, which briefly summarizes the major aspects of the particular word processor the class will be using. Follow the procedure in the handout for the demonstration. Have the student assistant operate the computer while you talk through the demonstration.

   a. Show how to load the program.

   b. Introduce the screen with the main menu options and briefly explain their functions.

   c. Load a demo file, different from the one the students will use, and make some editing changes where needed, eliciting suggestions from students; have assistant type in the changes that the class requests. Show how to save the file.

   d. Print the demo paragraph that has been edited. Talk about the print menu selections.

3. Assign students an exercise to load their demo file. Let them work in pairs. Have them discuss the errors and plan their editing strategies. When they have finished editing, have students save the corrected document using a different file name and print it out.

4. Assign students an exercise to type in a new essay from the same handout under a new file name. Demonstrate how to create a new file, provide paragraph indention, place double spaces between sentences and paragraphs. Let students work in pairs, checking each others' work as they go along. When they have finished editing, have students save the document and print it out.

5. Assign students an exercise to type a short essay with their own file name. Demonstrate how to delete documents as the storage diskettes will soon begin to fill up. Let students work in pairs, checking each other's essays and helping with editing. When they

have finished editing, have students save their individual documents and print them out.

6. Demonstrate how to change margins and tab settings. Have students practice on one of their documents, changing their short essay to half page size. Have students print out their documents with the new margin settings.

7. Assign the students an exercise to type their one page news article. Demonstrate how to change margin and tab settings for two column printing as in a newspaper, center titles and by-lines, capitalize titles, and use printing codes for right/left justified paragraphs. Have students work in pairs, helping each other with setting margins, editing and printing codes. Have students save their individual documents and print them out.

The Newsroom Program

1. Introduce The Newsroom program to the class by demonstrating how it facilitates positioning text around selected photos or clip art. Assign teams of students to prepare one page for the class newspaper by having them:

   a. Condense their own news article from one page to one-fourth a page or so;

   b. Retype the articles using The Newsroom's word processor, and position the stories on the page;

   c. Select appropriate clip art from the program, position them where desired, and rearrange the text as necessary;

   d. Provide page one with a distinctive banner for the top of the newspaper and all other pages with appropriate headings and paging;

   e. Print out the page after proof-reading and exchange with other teams for their critiques; make any necessary changes and print the final version of the page.

2. Disseminate copies of the collated newspaper to all class members and discuss the concerns of putting a newspaper together, the pros and cons of teamwork in such a project and the role of the computer in this type of work.

BANK STREET WRITER - REFERENCE NOTES
(Apple IIe 48K version)

To WRITE a document:
a) Get into the WRITE mode.
b) Type your document.
c) To indent for a paragraph, space 5 times.
d) Use the RETURN key at the end of a paragraph or if you are in the middle of a line and want to begin a new line, not at the end of the screen.

To CHANGE a character from one into another:
a) Get into the EDIT mode
b) Place cursor under the letter that you want to correct.
c) Press ESC to get into the WRITE mode.
d) Type the correct letter. The incorrect letter is still there.
e) Type the right arrow key to delete the incorrect letter.
f) Press ESC to return to EDIT mode.

To DELETE a character or space:
a) Get into the EDIT mode.
b) Place the cursor under the letter or space you want to delete.
c) Press ESC to get into the WRITE mode.
d) Type the right arrow key to delete the incorrect letter or space.
e) Press ESC to return to the EDIT mode.

To INSERT a character or space:
a) Get into the EDIT mode.
b) Place the cursor at the spot where you want to make an insertion.
c) Press ESC to get into the WRITE mode.
d) Type what you want to insert (character, word, like or space).
e) Press ESC to return to the EDIT mode.

To SAVE your document:
a) Get into the EDIT mode.
b) Use the apple keys to highlight TRANSFER MENU and press RETURN .
c) Use the apple keys to highlight SAVE and press RETURN .
d) Answer the questions accordingly by typing Y or N.
e) Type a filename and press RETURN .
f) The computer will ask you for a password. If you want to protect your document, type a password and then press RETURN . Otherwise, just press RETURN .

To PRINT your document:
a) Get into the EDIT mode.
b) Use the apple keys to highlight TRANSFER MENU and press RETURN .
c) Use the apple keys to highlight PRINT FINAL and press RETURN .
d) Default all print options (press RETURN for all questions).

To RETRIEVE or load a previously saved document:

a) Get into the EDIT mode.
b) Use the apple keys to highlight TRANSFER MENU and press RETURN .
c) Use the apple keys to highlight RETRIEVE and press RETURN .
d) Type Y for the catalog.
e) Type the filename and press RETURN .
f) If you protected the document with a password, type the password and press RETURN . If you didn't protect your document, just press RETURN .

To CLEAR text from the workspace:

a) Get into the EDIT mode.
b) Use the apple keys to highlight TRANSFER MENU and press RETURN .
c) Use the apple keys to highlight CLEAR and press RETURN .
d) The computer will ask you if you are sure you want to clear. Press Y for yes.

In the EDIT mode, in addition to using the arrow keys, you can scroll the document by using the following keys:

B - cursor moves to the beginning of the document
E - cursor moves to the end of the document
D - cursor moves down 12 lines
U - cursor moves up 12 lines.

SAMPLE ESSAY FOR CORRECTIONS

Computers in the Space Program

spaceships woldn't git of the ground fi it werent for computre.From the launchinggof the frist spacship in 1959, computer have ven used for space flits. They have helpeed plan the path of spaceships. They Have beenused to kep the ships on course and plan their lannding

Computers have prooved to be very importnat in emergenciis. Several year ago a leak wasfound in the oxigen tank of command module of the Apolle 13. There was only a small amount of oxygn left for emergency use. it was important to get the atronauts back to eatch as soon sa possible. Scientists, programmers, and computer operators at ten Manned Spacecraft Center in Houston, Texas, workked non-stop. They gave the copmuters information to use to plan a new flight path. With each new plan, the computers listed important data They told how long the Return flight would take. They tolded how much fuel and oxygen would be used. They gave the time and place of the splishdown. Thousands of factors had ot be considered.There was not enough time for the control center staff to work out al the calculations by themselves. By suing computers, They were able to plan a new course fir the Apollo's return. The astronautswere brought safly back to earth.

SAMPLE ESSAY
for Demo File

Before Corrections

A good grade is then prize you get when yu bet on yourslf. You can colect the prizes if you lae your talents and yor till to learn eack lesson an the line. Your effonts must be equal t the prize if you expect win.

do not forget hat a grade is jusl a symbol. What counts aer the things you lear and the new ksills you acquire. Theme are the lasging rewards of leerning. A pour grade is the only thin yo can get in this wurld without wurking for it.

School trains you todo tinks you shoud even htough ouy mya thnk they are a watste of time. In growng up, you wille find From small deeds well done, you lern how to hndle jobs of large size. You maye not be qute readies to run you school buty you can do a lost of things to help. Do those things extra well.

After Corrections

A good grade is the prize you get when you bet on yourself. You can collect the prize if you lay your talents and your will to learn each lesson on the line. Your efforts must be equal to the prize if you expect to win.

Do not forget that a grade is just a symbol. What counts are the things you learn and the new skills you acquire. These are the lasting rewards of learning. A poor grade is the only thing you can get in this world without working for it.

School trains you to do things you should even though you may think they are a waste of time. In growing up, you will find that it is the little things that count. From small deeds well done, you learn how to handle jobs of large size. You may not be quite ready to run your school, but you can do a lot of things to help. Do those things extra well.

SAMPLE ACTIVITY #2
Enter Viktor Verbatim's
Microcomputer World

Subject:

Language Arts - Reading/Writing

Computer Literacy Student Expectation(s):

1.1.4. Selects/Uses written resources
1.2.2. Determines structural components
1.4.2. Operates with words/symbols
1.5.1. Seeks work/play with computer
1.5.2. Uses positive affect words
3.1.1. Identifies the input/output peripherals
3.3.2. Understands pros/cons of routine tasks

Instructional Mode:

Topic and Tutor

Prerequisite(s):

None. This activity can serve as a prerequisite for Language Arts Sample Activity #3 - Learn in a Computer Lab, (pages R-39 - R-46).

Classroom Management:

Regular classroom setting to contain (on days they are needed):

- A VCR System (for large group, video viewing);
- One Microcomputer System for large group viewing and student trial use with problem-solving software (CPU/Keyboard unit, Disk Drive, Monitor and Joystick, optional for games);
- One large, TV monitor to use with the microcomputer setup to allow entire class to see results of demonstrations;
- A large group instructional easel with felt pens or chalkboard;
- Optional: A comprehensive Independent Reading Library of magazines and books.

Materials:

Teaching Kit: The Flip Side of Floppies, A Basic Introduction to Computers and Floppy Disks Featuring Robot Tutor Viktor Verbatim by Verbatim Corporation. This kit is available through TAC; see the list of Additional Teaching Aids in this resource unit.

Teacher-written notes as an example of the Crises Notetaking skill. A sample handout, "Crises Notes on Viktor Verbatim," follows this activity; (Handout #1).

Teacher-created journal cover sheet: "My Computer Journal, A Reference Manual." A sample cover sheet follows this activity; (Handout #2).

Teacher-made lab posters on lab rules, computer functions and operations. (Six samples are provided in Handout #3.)

Teacher-made poster for end-of-period reminders: "Do Remember." A sample is provided at the end of this activity; (Handout #4).

Suggested software:

Mind Puzzles, Summer Games, Teasers by Tobbs or other simple problem-solving software;
Mastertype, Know Your Apple or other touch-type tutor kits.

Resources for reference or text, such as:

- Apple IIe Owner's Manual by Apple Computer Inc.; Chapter 2, pages 32-38.
- The Apple Computer Clubs' Activities Handbook by Samuel K. Miller and Michael E. Caley; pages 2, 9-29, 31-32, and 78-79.
- Computer Thinking - New Techbooks by Patricia A. Relf; Chapter 2, pages 4-13, 18.

Time for Activity:

Five to ten class periods, the actual number depending on which activities the teacher decides to do.

Teacher Preparation:

Read and study the above materials. Practice presentation of lessons. Prepare handouts in advance.

Sequence of Activities:

Verbatim Activities

1. Begin the lesson by administering a short Pre-Test (10 items) prepared by the Verbatim Corporation.

2. Show the class the video prepared by the Verbatim Corporation.

3. Distribute Handout #1, "Crises Notes on Viktor Verbatim," as an example of the Crises Notetaking skill that is instrumental in ensuring that students learn and retain enough from videos, tapes and lectures.

   a. Review the major features of this skill. Lecture from this handout to show students the power of such notes.

   b. Compare these notes with the video script. Have students note how useful such a skill can be in recalling facts when comparing it to the kind of information one recalls from memory.

   c. Legitimize this skill as necessary for the year's study both in computers and other Language Arts units.

d. Discuss the content of the notes/script for better computer understanding.

e. Display and demonstrate the actual handling of a diskette with a computer setup.

4. Distribute Verbatim Corporation's handout, "A Few Words About Computers."

   a. Discuss, illustrate, and demonstrate the essentials of these terms for effective learning. Have students copy your illustrations, the terms, and definitions; encourage them to take crises notes on important concepts.

   b. Have students do a final form of the day's notes at home.

5. When students return with homework:

   a. Do a demonstration lesson on the difference between Crises Notes and Study Notes. Point out how they look essentially the same, except that Crises Notes are a bit messy having been done under pressure where the "speaker" does not pause to allow the writer to record all the information. Study Notes are neater having been done under less stressful conditions, usually at home.

   b. Distribute Handout #2, "My Computer Journal - A Reference Manual" handout. This is to be the cover page for the students' journal of notes, rules and other references. Point out to students that this journal will be valuable not only this year when they are in the lab but also in years to come, for there is just too much technical information for a student to memorize or trust to memory.

      Note: Inexpensive, even faded, construction paper can be folded into manila folder size for this journal. When the cover page is taped to the cover, the folder takes on a new look. Students may label, color or illustrate the cover as they wish to make their folder distinctive. Have all students insert their Computer Terms Study Notes into this Computer Journal as its first entry.

6. Distribute Verbatim Corporation's pamphlets, entitled "Care of Floppies." Review for all, what is involved in Study Notetaking. Demonstrate the skill. Remind students that this is a crucial skill for Language Arts students, if they are to get the most out of their reading in all of their classes.

   a. Allow class time for students to take careful Study Notes from the pamphlet and let them finish their study notes at home.

   b. When this second homework is returned, have students insert it into their journal of notes.

7. Display and discuss the three posters that come with the Verbatim Corporation Kit:
   - "Parts of the Floppy Disk"
   - "Care of the Floppy Disk"
   - "Floppies and Disk Drives"

8. Use the handout, entitled "Lesson 1- Computer Hardware," from the Verbatim Kit to teach a lesson on this topic. Assign the two interactive activities suggested on the handout.

9. Use the handout, entitled "Lesson 2- The Floppy Disk," from the same kit and teach a lesson on this topic. Assign the three interactive activities.

10. Use the handout, entitled "Lesson 3- Proper Disk Care," from the same kit and teach a lesson on this topic. Assign the two interactive activities.

11. Use the handout, entitled "Lesson 4- How It all Works," from the same kit for the fourth lesson. Assign the three interactive activities.

12. Administer Verbatim Corporation's Post-Test to students.

Follow-up Activities

1. Discuss the set of computer lab rules established by the school or computer lab coordinator. Make use of an easel, the classroom chalkboard, games, quizzes, posters, and so forth to illustrate the rules. Sample posters, Handout #3, follow this activity. These can be mounted on lab walls for quick reference. Direct students' attention to the end-of-period reminders, Handout #4, that can be posted on the door.

2. Allow students who earn the privilege to use the computer in the classroom with minimal guidance from you and/or other experienced students. Provide an assortment of simple problem-solving software and touch-type tutor kits for their use. If possible, allow all students an opportunity at the computer before you take the entire class into the lab. Less disciplined students could be teamed up with more responsible students in order to afford them computer-use opportunities as well.

3. Prepare and assign students to do a free-flow paper on: "My Microcomputer Experiences and Thoughts, to Date." Use appropriate evaluative techniques of your choice to discern student computer behaviors and attitudes from this experiential account.

Crises Notes Sample on Viktor Verbatim

★ Flip Side of Floppies:
1) Technol. Tutor = Vik Verbatim
2) Scan Computers
3) Know how work?
4) Know parts?
5) To get work done
6) To keep info safe
7) To become a Computer Whiz!

★ Hardware:
1) Microprocessor = brain; works with other parts
2) Keyboard with keys for input
3) Monitor or screen to see input, data
4) Printer to give info on paper from computer
5) Disk drive moves floppy disk around like record player; with read/write head to read or write on disk from head; screen window)

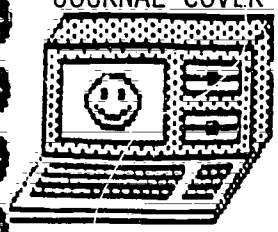
★ Software:
1) Instructions
2) Floppy Disks like records with info, called data disks
3) Plays back as needed
4) Disks store info in concentric circles ◎, not spiral as records ◎
5) Magnetic coating to store data

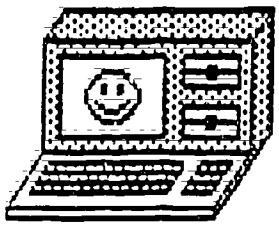
★ Care of Floppy Disks
1) Label with felt-tip pens
2) No fingerprints, dust, smoke, heat, cold or sharp objects
3) Store in jackets in upright containers

R-27

JOURNAL COVER SHEET

Handout #2
Viktor Verbatim

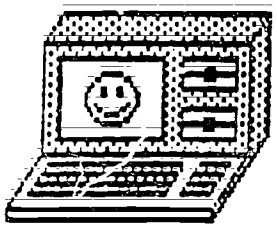


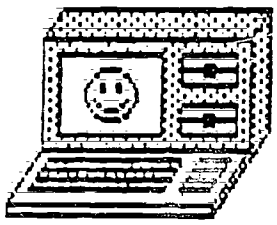


MY COMPUTER JOURNAL

NAME:.....

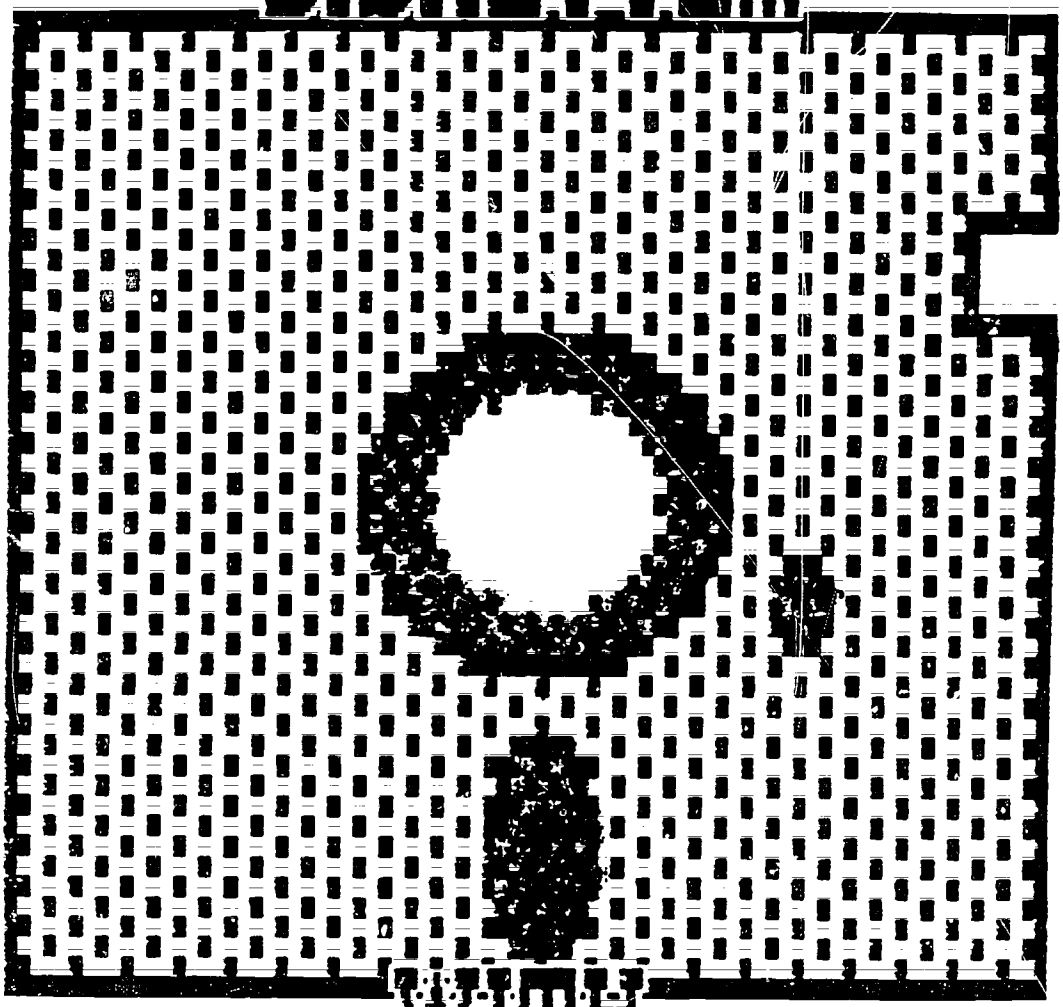
DATE:.....PD:.....





A REFERENCE MANUAL!

IMPORTANT: HANDLE THIS DISKETTE...



WITH EXTREME CARE.

HINT:

"COLD BOOT"

START?

- INSERT DISKETTE
- CLOSE DOOR
- TURN ON COMPUTER

HINT: RUNAWAY DISK?

DO:

- TWO FINGERS
- CONTROL
& RESET

HINT:

"WARM BOOT"

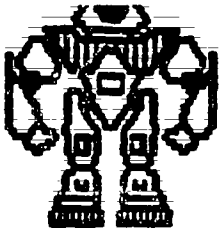
RESTART?

- 3 FINGERS

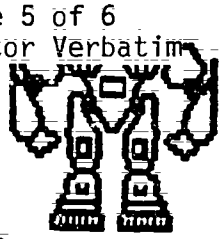
- CONTROL +

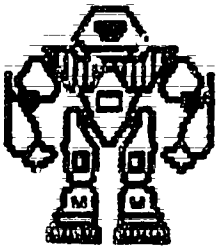
OPEN APPLE +

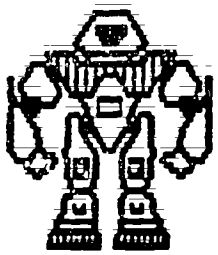
RESET

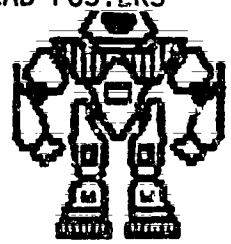


CAUTION: NEVER USE PENCILS AND/OR ERASERS IN THE COMPUTER LAB.

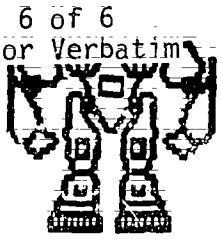




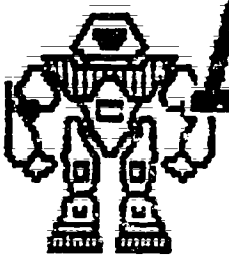


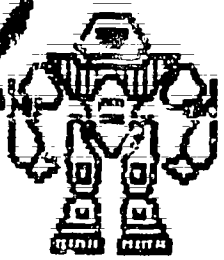


CAUTION:



NEVER REMOVE, INSERT, OR TOUCH A DISKETTE IN A RED-LIGHTED DISK DRIVE.

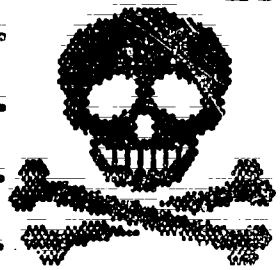
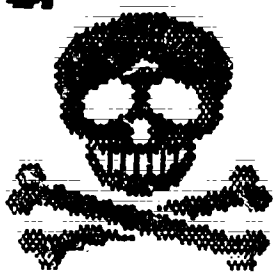




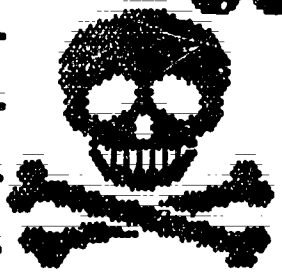
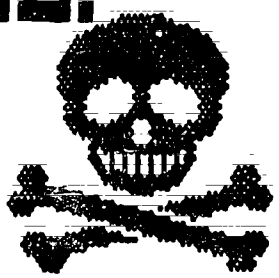


DO REMEMBER!

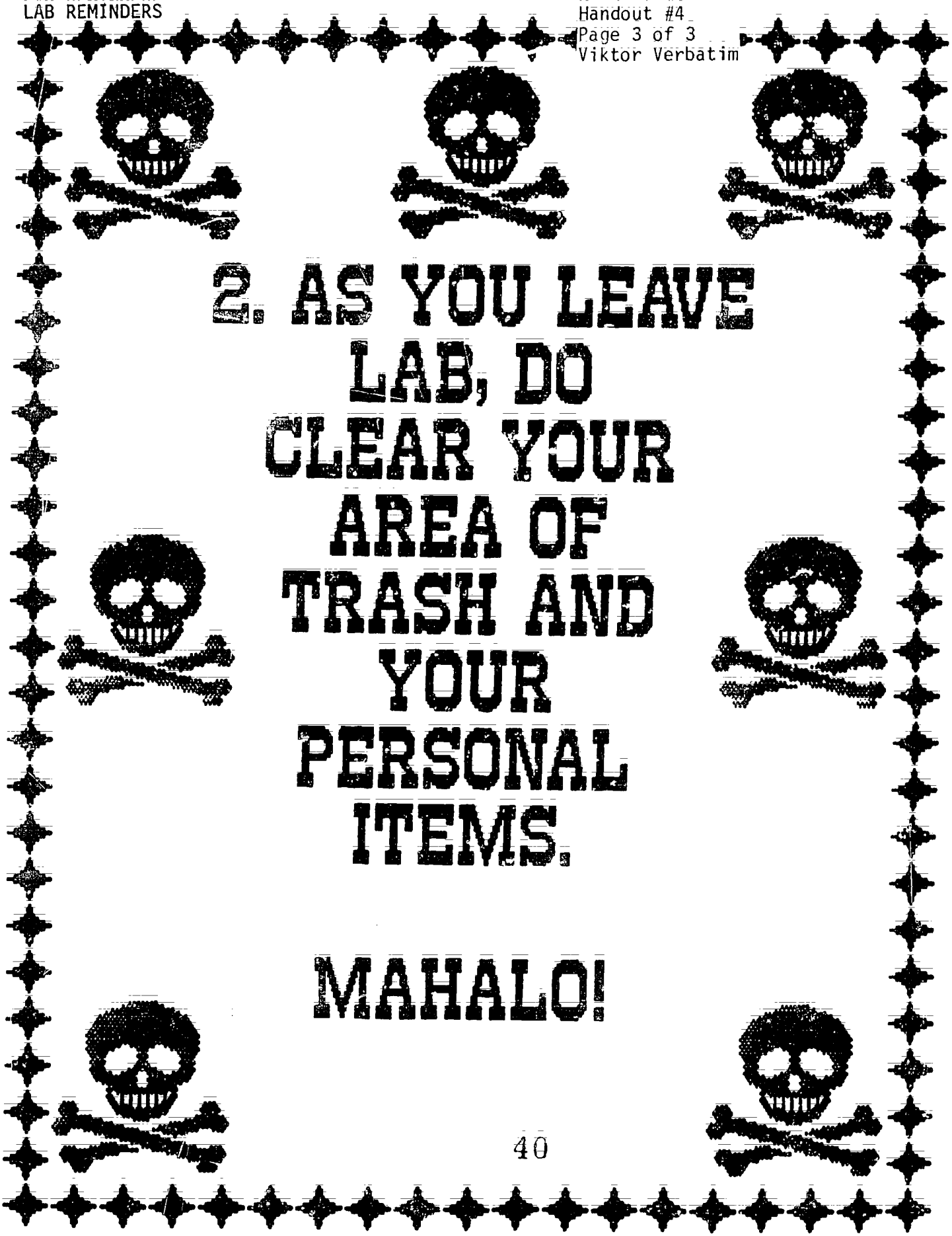
1. WHEN LEAVING LAB:

- LEAVE ALL SOFTWARE MATERIALS ON COMPUTER TABLE.


-LEAVE FLOPPY DISK BEING USED IN DISK DRIVE.
-LEAVE CHAIRS IN NEAT ORDER AS SHOWN EARLIER.



2. AS YOU LEAVE LAB, DO CLEAR YOUR AREA OF TRASH AND YOUR PERSONAL ITEMS.

MAHALO!

SAMPLE ACTIVITY #3
Learn In A Computer Lab

Subject:

Language Arts - Reading/Writing (Other content areas will find this activity useful as well.)

Computer Literacy Student Expectation(s):

1.1.1. Recognizes computer instructions
1.1.2. Reads instructions, keyboard, output
1.1.3. Uses control keys/commands
1.1.4. Selects/Uses written resources
1.1.5. Experiments as a user
1.1.6. Responds to error messages
1.2.1. Rationalizes information processing
1.2.2. Determines structural components
1.2.3. Sequences process steps
1.2.4. Recognizes computer processes
3.1.1. Identifies input/output peripherals
3.1.2. Describes functions of input, output and processing

Instructional Mode:

Topic and Tutor

Prerequisite(s):

Language Arts Sample Activity #2 - Enter Viktor Verbatim's Microcomputer World, (pages R-23 - R-37). This activity can serve as a prerequisite to Language Arts Sample Activity #3 - Meet the Milliken Word Processor, (pages R-47 - R-52).

Classroom Management:

Both a regular classroom setting and computer lab setting are needed. A ratio of two students per computer is recommended, with three students per computer a maximum.

Material(s):

One to four large keyboard charts in the lab.

Suggested software:
Mastertype or other touch-type tutor kits;
Mind Puzzles, Summer Games, Teasers by Tobbs or other simple problem-solving software;
Apple Presents Apple or other introductory software on use of the computer.

Handouts, such as: (Samples are provided at the end of this activity.)
- "Care of Diskettes" by MECC; (Handout #1);

- "My Experiences in the Classroom with Summer Games, Mastertype, and/or Apple Presents Apple;" (Handout #2);
- "Apple Presents Apple - Intro: Crises Notetaking" or some other title for introductory software on use of the computer; (Handout # 3).

Resources for reference or text, such as:

- Be A Computer Literate, by Marion J. Ball and Sylvia Charp.
- Introduction to Computer Programming - BASIC for Beginners, by Brian Smith.
- Computer Dictionary - New Techbooks by Scholastic, Inc.
- Usborne Guide to Understanding the Micro - How it Works and What It Can Do, by Judy Tatchell and Bill Bennett.
- Apple IIe Owner's Manual by Apple Computer Inc.; Chapter 2, pages 20-43; Chapter 4, pages 62-81.
- The Apple Computer Clubs' Activities Handbook by Samuel K. Miller and Michael E. Caley; pages 9-18, 21-32, 45-46, 78-84.
- COMPUTER LITERACY - Problem-Solving with Computers by Orrin E. Horn and James L. Poirot; pages 11-25, 149-185.

Teacher-started, three-hole binder, entitled Glossary of Acronyms and Terms, using pages 119-141 from the Grades 7-8 Guide. Part I should be the guide pages, and Part II should be set aside for the fully-illustrated and colored, "Improved ACRONYM and TERMS illustrations."

A cassette player with headset and the cassette training kit, entitled "How To Operate The Apple IIe- Three Audio Cassettes and Operator's Guide," by Howard Manthei and Lee McFadden.

Time for Activity:

Five to ten class periods, the actual number depending on which activities the teacher decides to do.

Teacher Preparation:

Review the above materials. Prepare handouts in advance.

Sequence of Activities:

Pre-Computer Lab Work

1. Review the work, student progress and concepts connected with:

   a. Lab rules, presented earlier in Sample Activity #2, (pages R-29 - R-37).

   b. Exploration of the Mastertype kit: Explain the value of homekey, touch-typing abilities with respect to word processing;

c. Exploration of a few simple games, like Summer Games, for developing facility with the microcomputer.

2. Distribute Handout #1, entitled "Care of Diskettes." Have students copy items #1, 3, 4, 5, 6, 7, 11, 12, and 13...one per journal page so that the rules are large enough to make an impact on a reader. Do encourage students to create their own illustrations.

   a. Post a few good samples and insert others in the teacher-started/student-completed acronym and term folder on display in the lab.

   b. Students whose pages have been selected for wall or folder display should receive a photocopy of their work, stapled to a certificate of some sort for insertion into their journal.

3. Using Handout #2, have students write a free-flow paper on "My Experiences in the Classroom with Summer Games, Mastertype and/or Apple Presents Apple." Have them insert it in their journal of notes.

4. Introduce and scan booklets, such as Be a Computer Literate by Ball and Charp and Introduction to Computer Programming - BASIC for Beginners, by Smith. Announce that these will be available in both the lab and the classroom at future class sessions, for students to explore during independent study.

5. Call students' attention to a teacher-made, three-hole binder, entitled Glossary of Acronyms and Terms.

   a. Review with students what is now in the binder and its purpose in assisting them with the learning of computer vocabulary. Explain that it will be kept available to all students in the computer lab. Encourage students who wish to earn an extra credit grade (maximum, two a quarter/per student) to do an illustrated, captioned page on either a word heretofore unillustrated in the binder or a word that has been learned in class lessons or in one's independent computer study. Require that all captions be written in clear sentences.

   b. Call students' attention to the workbook, entitled Computer Dictionary - New Techbook. Make it available for reference in the classroom and the lab. Stress that if a student selects a word to illustrate from this source, he/she must paraphrase the definition and create his/her own illustration, rather than merely copy the information and illustration from the workbook. The same goes for any other published word source. In this way students are directed to practice their reading/thinking/paraphrasing skills.

Computer Lab Work

1. Take the entire class to the computer lab. Conduct an orientation session with students, stressing lab rules, expectations and responsibilities.

   a. Review the basics of operating a microcomputer. Explain the differences between program diskettes and data diskettes, showing examples of each.

   b. Introduce students to the program diskette, Apple Presents Apple, or some other introductory software on use of the computer. Review the difference between a "cold" and a "warm boot." Have teams do both. Emphasize the importance of the "warm boot" when changing from one program disk to another.

   c. Allow students independent time to explore the program with their teammates. Use the time to go from team to team to check progress and provide help as needed. Five minutes before the period ends, take the class through the steps for closing up and leaving. Establish and explain a system that accounts for all diskettes while students are still seated.

2. Next lab day, review what happened on the first lab day. Get all computers and students to the point where the computers are ready to work with Apple Presents Apple again. Distribute Handout #3, entitled "APPLE PRESENTS APPLE: INTRO - Crises Notetaking." Direct all to record name(s), date and period at the top of page. Now the class is ready to begin Crises Notetaking.

   a. Get students to practice cooperative production NOW, rather than later. If students are in pairs, have one serve as the operator and the other as the recorder. If three students are on a team, one can be the operator, one the recorder and one the reader of the monitor. Cooperative production is a more efficient way for a computer team to operate. Remind students to rotate positions after designated intervals.

   b. Start all teams off by doing about 10 minutes of notes on the easel or chalkboard with all students copying these notes. Use this time to demonstrate how a student thinks, as well as records notes. Students will appreciate the finer points of good Crises Notetaking.

   c. When the class seems to be well on its way, allow the teams to continue independently. Check on team progress and help as needed.

3. For the next day of lab use, allow the teams to finish their crises notetaking on Apple Presents Apple.

4. During independent activity lab sessions, also make available as additional options the following types of programs.

a. Simple problem-solving software, like Mind Puzzles, Summer Games or Teasers by Tobbs

b. Touch-type tutoring program, like Mastertype.

5. Deliver a lecture-demonstration (with easel or chalkboard illustrations) to the class on:

   a. How the Computer Works. A chart that features the basic four functions (Input, Storage, Processing and Output) is extremely useful in getting ideas across.

   b. The Arithmetic/Logic and Control operations within the CPU (computer brain). With extreme care that nothing falls into the CPU, do open its cover and allow students to get a quick, inside look. Distribute handouts showing the inside of the CPU for class discussion. (An adequate picture can be found in the Apple IIe Owner's Manual, page 63.)

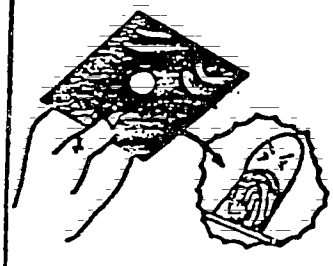
6. It may be helpful to make special readings available at this time for students to study. One interesting anecdote worth reading and discussing is the tale about Grace Murray Hopper and the term, bug. Do stress the danger that bugs like water, magnets, paper clips and dust pose to computers. Encourage students to bring in news clippings pertaining to computer use in our society, have them share the articles orally and then post them on a bulletin board.

7. Time for a Free-Flow journal entry: Ask students to write on "My Microcomputer Experiences To Date."

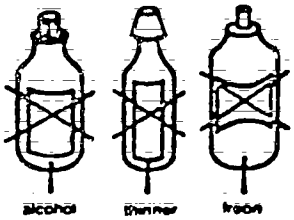
8. Allow students to use a cassette player with a headset, so they can study the kit, entitled "How to Operate the Apple IIe, (or some other kit relevant to the microcomputers used in the lab) during independent activity sessions both in the classroom and the lab.

Sixteen Rules

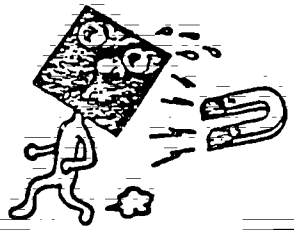
1. Do not touch disk surface. It is easily contaminated, which causes errors.



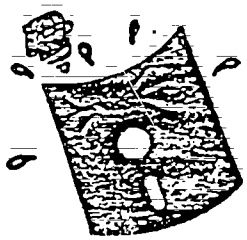
2 Do not use alcohol, thinners or freon to clean disk.



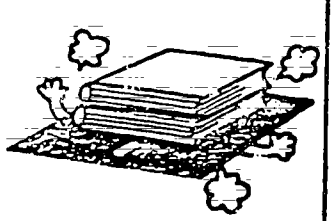
3. Do not use magnets or magnetized objects near the disk. Data can be lost from a disk exposed to a magnetic field.



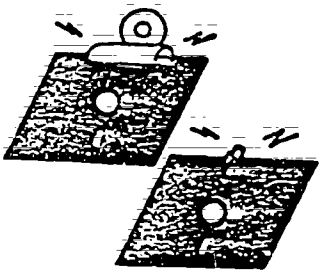
4. Do not bend or fold the disk.



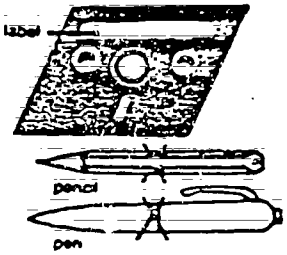
5 Do not place heavy objects on the disk.



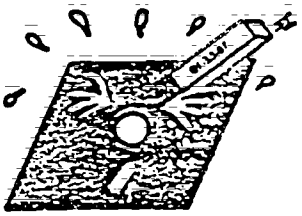
6. Do not use rubber bands or paper clips on the disk.



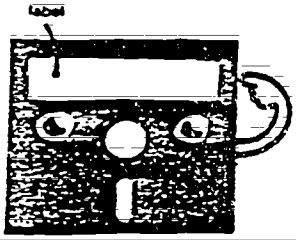
7. Do not write on disk label with pencil or ball-point pen. Use felt-tip pen only.



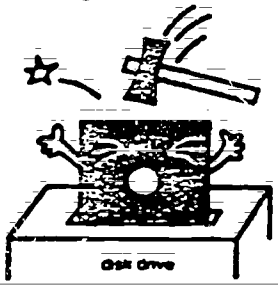
8 Do not use erasers on disk.



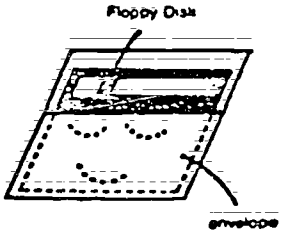
9. Apply index label to the right of our label. Do not use labels in layers.



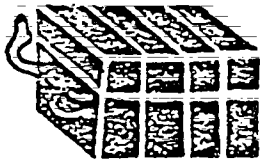
10. Insert carefully, by grasping upper edge and placing it into the drive.



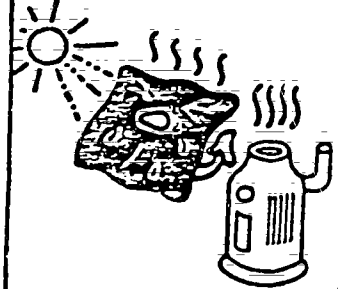
11. Keep disk in its protective envelope when not in use.



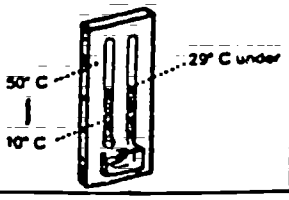
12 Disks not being used should be stored vertically in their box.



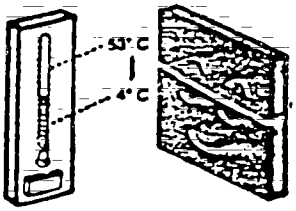
13 Do not expose the disk to excessive heat or sunlight.



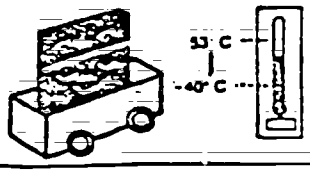
14. Operating environment:
A. Temperature 10°C to 50°C (50°F to 122°F)
B. Wet Bulb Temperature: Less than 29°C
C. Relative Humidity: 20% to 80%



15. Storage environment:
A. Temperature: 4°C to 53°C (40°F to 127°F)
B. Relative Humidity: 8% to 80%)



16. While in transit the disk should be in its envelope in a protective box within the following ranges:
A. Temperature: -40°C to 53°C (-40°F to 127°F)
B. Relative Humidity: 8% to 90%



LAB EXPERIENCES

Handout #2
Computer Lab

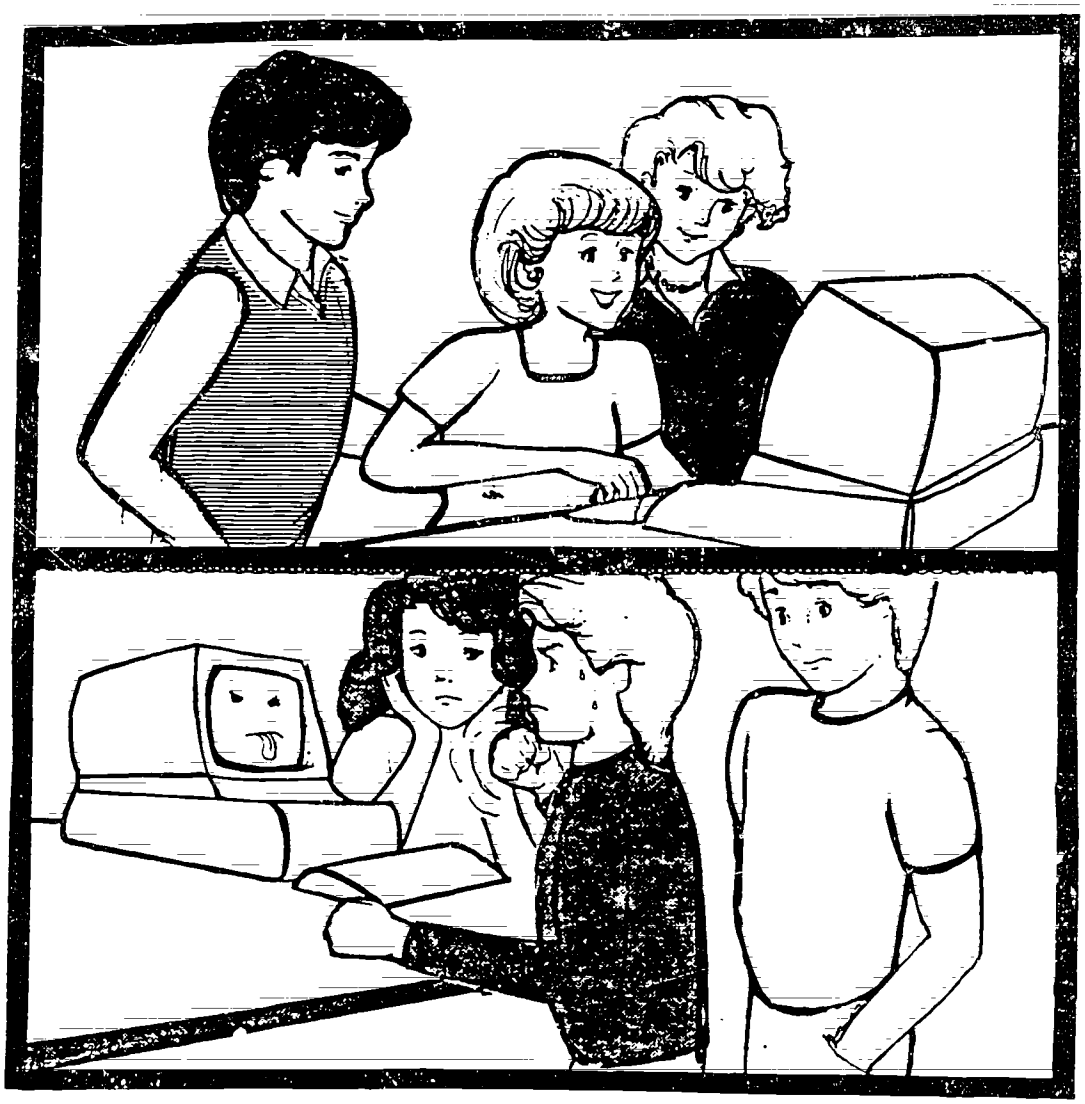
NAME_____

PERIOD_____

DATE_____

MY EXPERIENCES IN THE CLASSROOM WITH
SUMMER GAMES, MASTERTYPE, AND/OR APPLE PRESENTS APPLE

Writing Skill: Free-flow!



APPLE PRESENTS APPLE: INTRO -
Crises Notetaking

SAMPLE ACTIVITY #4
Meet The Milliken Word Processor

Subject:

Language Arts - Writing

Computer Literacy Student Expectation(s):

1.1.1. Recognizes computer instructions
1.1.2. Reads instructions, keyboard, output
1.1.3. Uses control keys/commands
1.1.4. Selects/Uses written resources
1.1.5. Experiments as a user
1.1.6. Responds to error messages
1.4.2. Operates with words/symbols
1.5.1. Seeks work/play with computer
1.5.2. Uses positive affect words
3.2.1. Identifies applications
4.2.1. Describes how computers assist people

Instructional Mode:

Tutor/Tool/Topic

Prerequisite(s):

Language Arts Sample Activity #3 - Learn in a Computer Lab, (pages R-39 - R-46).

Classroom Management:

Computer lab setting with two students per computer is recommended. For classroom demonstrations, there should be one compute with a large monitor in addition to the usual table model and at least one printer. Two to four printers would be best in the lab.

Material(s):

The Milliken Word Processor Kit, which consists of:
- a teacher's manual
- a program disk
- a data disk, called File Cabinet Diskette

Wall chart or easel drawing of the main menu for this program; it is called the DESK.

Easel drawings of the other sub-menus:
- Welcome to the Help Manual
- Writing Tools
- File Cabinet
- Typewriter

Blank diskettes - one per student.

The Apple II DOS 3.3 System Master Utility disk for formatting and initializing all blank diskettes.

A teacher-made list, entitled "CLASSROOM/LAB INDEPENDENT ACTIVITY OPTIONS." A sample follows this activity.

A teacher-collated reference folder, entitled "Milliken Word Processor Reference," pages 1-20, by Milliken Publishing Company. Important: Do secure permission to duplicate.

News articles about computer-related topics for discussion or journal, reaction writing.

Teacher Reference manuals:

- Apple IIe Owner's Manual by Apple Computer Inc.; pp. 54, 76-79, copyright 1985.
- Apple IIe Owner's Manual by Apple Computer; pp. 64-65, copyright 1983.
- The Apple Computer Clubs' Activities Handbook by Smauel K. Miller and Michael E. Caley; pp. 167-169.

Time for Activity:

Two to four weeks, integrating computer use within a unit on composition and/or grammar.

Teacher Preparation:

Review the above materials. Practice presentation of lessons. Prepare handouts in advance.

Use the Apple II Owner's Manual (both editions) and the Apple II DOS 3.3 System Master utility disk to study and prepare the needed data disks. Do number all the data disks made for lab use in successive order so that the assignment of a numbered disk to a particular team can be easily carried out and tracked. Organize these diskettes in a file box according to classes.

Do make sure that the lab has a list of independent options available and ready for student lab use. Refer to a sample list of options provided at the end of this activity.

Sequence of Activities:

Pre-Computer Lab Work

1. Do a lecture with easel or chalkboard illustrations on:
   - What Word Processing is All About;
   - How Word Processing Differs from Typewriting;
   - The Major Advantages of Word Processing;
   - The Major Disadvantages; and
   - The Role the Milliken Word Processor Can Play in Language Arts.

2. Introduce (with the help of the easel or chalkboard) the basic terms students must learn for word processing. Some of them are: back-up, cursor, delete, editing, file, free-flow writing, menu, prompt, revising, and wrap-around arrow.

Lab Session #1 - Introduction to the Word Processor

1. Use the program disk (from the Milliken Word Processor kit) to help each team boot their machine, one team at a time. A lab assistant might help with this process in advance.

2. Once the program has been booted, remove the program disk, insert the students' assigned team data diskette, close the disk drive, and suggest that the team study the Help Manual section while waiting for the class to commence large group instruction. Show them how to get to the Help Manual this first time. As you distribute data disks, hold teams responsible for labeling their disk number; this will go a long way towards developing student responsibility and preventing disk mix-ups.

3. After the students have had a few minutes to study the Help Manual section, call the class to order and direct them back to the Desk, the main menu. With the help of a wall or easel chart, explain this menu in concrete, experiential terms. Liken it to the table of contents in a book and the menu in a restaurant. Give students a quick explanation of what the options - Help Manual, Writing Tools, File Cabinet and Typewriter - really mean.

4. Direct the students to the Writing Tools option and have them type at the top, left-hand corner of the monitor the phrase - "Original Rough Draft, Day #1!" Then ask them to identify their work immediately with a byline that includes name(s), date, period. It is best to require that all teams work on a group composition and leave individual enterprises for another day when all are more secure with the computer.

5. Give teams time to free-flow as taught earlier in Sample Activity #3. Fifteen minutes before the class ends, direct all on how to save their work using the File Cabinet option. Ask all teams to label file work done today as L1FB02P1: (L1 stands for Lab Session #1; FB02 stands for Feb. 2; P1 stands for the class period.) Close the class, account for materials, and dismiss the students as all have been trained in Sample Activity #3.

Lab Session #2 - Retrieval and Update of a File

1. Review what was done and learned at session #1. Direct students on how to retrieve their work. (Write down the process on the easel or chalkboard.) Request students to type at the top, left-hand corner of the monitor the phrase - "Original Rough Draft, Day #2!"

2. Remind all that in the spirit of EQUAL TIME FOR ALL, those students who had the least amount of operating time last period should now begin work as the team's operator and enjoy more time at the key-

board. Have students re-identify their work with a new byline that includes name(s), today's date, and the period.

3. Allow the entire period for students to finish their original, free-flow composition.

4. Circulate to help students and note progress and/or needs. Do stop the class if a problem needs discussing before everyone. Always write as you explain so that what you say can be referred to later by yourself or a student.

5. Fifteen minutes before the class ends, review the notes on how to save one's work. Explain how one preserves the first day's work by always creating a new file title for the new day's work. Ask all to file their day's work under the title, L2FB03P1. Explain and write on the easel or chalkboard the instructions on how teams can doublecheck the effectiveness of their efforts at saving their files.

Lab Session #3 and #4 - Printing and Independent Options

1. Review what was done and learned at session #2. Have students retrieve their session #2 work.

2. Guide them as they re-identify their work for this third day, taking into account the student who needs to start off as operator and be listed as the day's leader.

3. Explain, demonstrate, and note on the easel or chalkboard the sequence of steps for printing lab session #2's work. Ask the students who are the team leaders for the day to neatly stack the hard copies and carefully file the data disks in the teacher's file box, when the printing is finished.

4. Provide an independent activity session for those who have finished printing. A sample list of independent options is provided as a handout. Reference materials for these options are listed in the Language Arts Sample Activity #3 from the Resource Unit - Learn in a Computer Lab. Help students select and pursue these options. When the printing of all session #2 work has been completed, the papers accounted for, and the disks all neatly stored in the class file box, have the remaining students join in the independent activity.
options.

5. Fifteen minutes before the bell rings, take stock of class progress. How far has the class gotten with respect to the printing of session #2's work? How far have the students gotten with the independent options? What more needs to be done when we meet again? End class in the usual, orderly manner; dismiss all when materials are accounted for.

6. For the next day, lab session #4, distribute the hard copies of work from session #2 to all teams for discussion.

7. Repeat the steps from session #3 involved with printing the work from session #1. Provide time again for independent options work.

Lab Session #5 - Editing and Revision

1. Distribute the hard copies of work from session #1 to all teams for discussion. Make enough copies so that all team members may have copies of session #1 and #2 team work for their individual journals. The teacher may now grade/evaluate student work using these hard copies and file them for the records.

2. Make student copies of pages 1-20 from the Milliken Word Processor Teacher's Manual, if you have secured the publisher's permission. Encourage students to teach each other additional word processing skills by referring to these pages during independent option time. For example, students could learn how to block delete, block move, find, clear, erase whole files, custom print, and use various control key combinations.

3. Ask students to retrieve the work they did during session #2. Explain that they will have the entire period to revise their work so that it will be the best they can produce, following the basics of good sentence structure, correct grammar, spelling and smooth sentence flow. This work should be labeled as, "Revision #1, Day #1."

4. Monitor progress and team needs. Fifteen minutes before the period ends, review the notes on how to save one's work. Remind students about saving the revision as L5FB10P1.

Follow-up Activities

By now, teacher and students are well oriented to computer work both in the classroom and the lab. The following topics are suggested follow-up activities.

1. Revision of future team or individual writings on disk, according to:

   a. Peer team evaluation and suggestions;

   b. Teacher evaluation and suggestions;

   c. Lecture presentation on grammar principles;

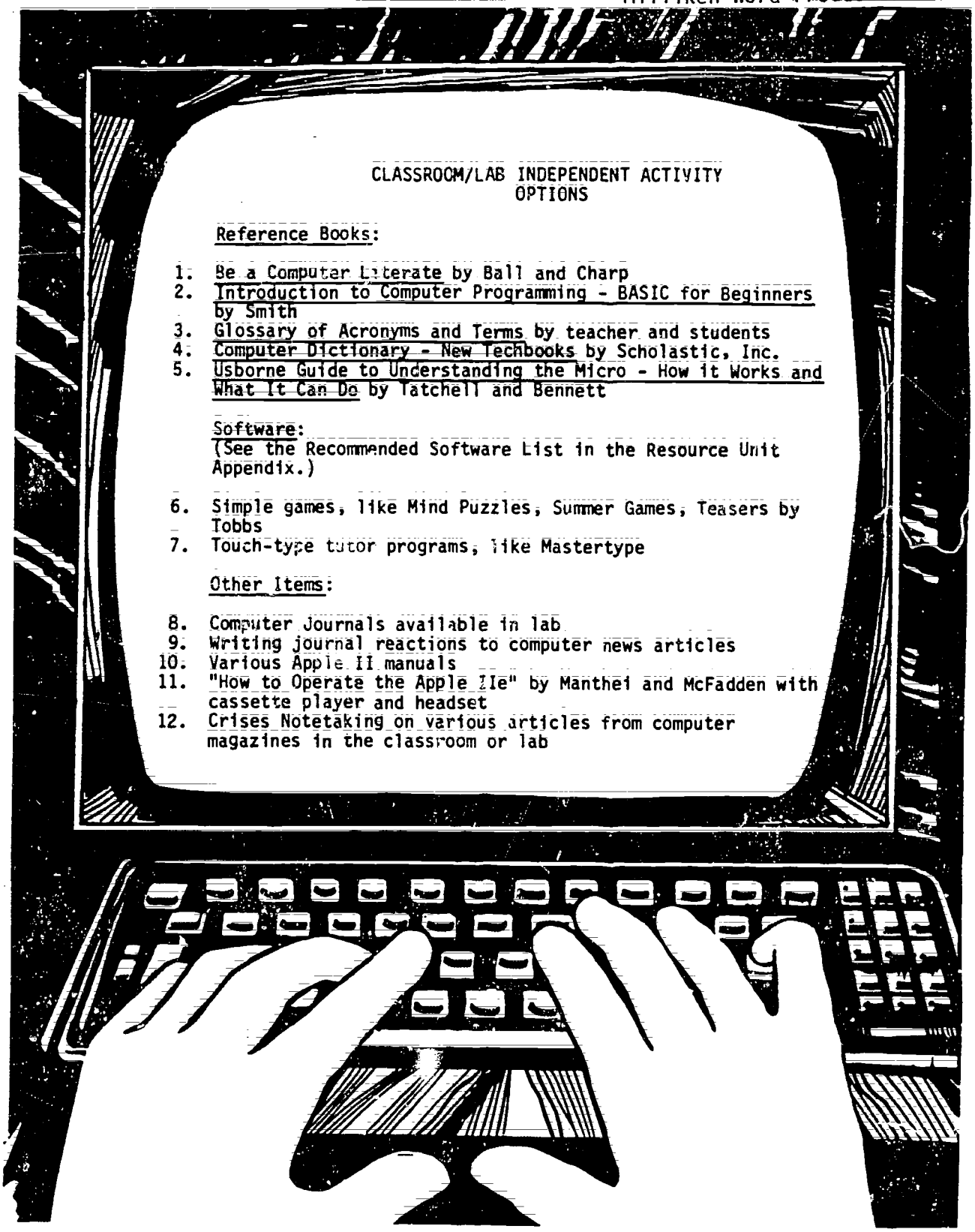
   d. Lecture presentation on basic composition principles;

   e. Lecture presentation on editing principles.

2. Illustrating written work for publication.

3. Printing of publication pages.

4. Collating/Binding a class publication.



CLASSROOM/LAB INDEPENDENT ACTIVITY
OPTIONS

Reference Books:

1. Be a Computer Literate by Ball and Charp
2. Introduction to Computer Programming - BASIC for Beginners by Smith
3. Glossary of Acronyms and Terms by teacher and students
4. Computer Dictionary - New Techbooks by Scholastic, Inc.
5. Usborne Guide to Understanding the Micro - How it Works and What It Can Do by Tatchell and Bennett

Software:
(See the Recommended Software List in the Resource Unit Appendix.)

6. Simple games, like Mind Puzzles, Summer Games, Teasers by Tobbs
7. Touch-type tutor programs, like Mastertype

Other Items:

8. Computer Journals available in lab
9. Writing journal reactions to computer news articles
10. Various Apple II manuals
11. "How to Operate the Apple IIe" by Manthei and McFadden with cassette player and headset
12. Crises Notetaking on various articles from computer magazines in the classroom or lab

SAMPLE ACTIVITIES
MATHEMATICS

MATHEMATICS COURSE CONTENT OBJECTIVES

At the intermediate school level two one-year courses, Mathematics Applications: Phase I (Grade 7) and Mathematics Applications: Phase II (Grade 8) are required. Within the Mathematics Basic Program is the emphasis on developing abilities for applying arithmetic, geometric, measurement and statistical concepts and skills. The Basic Program, which extends the K-6 continuum, delivers basic competencies and related mathematics broadly to real life situations. The overall goals of the Secondary Mathematics Program are to have students:

1. Develop mathematical competence to function effectively in today's society.

2. Develop understanding of the importance and relevance of mathematics historically and in the world today.

3. Develop ability to think critically and to solve problems.

4. Nurture intellectual curiosity and the desire to continue learning.

Of the Mathematics course content objectives delineated in The Founuation Program's Authorized Courses and Code Numbers (1986-1988) for the Basic Program, (page F-5), six in particular are addressed by the following sample activities. The chart below summarizes the course content objectives reinforced by the activities.

Course Content Objectives	Sample Activities #1	#2	#3	#4	#5
Mathematics Applications: Phase I					
1. Review and extend understandings and skills of the K-6 program.	x	x			
2. Develop proficiencies in the use of numbers and operations, including simple mental arithmetic, the basic operations with whole numbers, fractions and decimals, and ratios and simple proportions.	x	x	x	x	x
3. Develop proficiencies in estimating and measuring with standard units, including metric units.			x		
Mathematics Applications: Phase II					
1. Review and extend understandings and skills of the K-7 program.			x	x	x
2. Develop proficiencies in the use of numbers and operations, including [illegible] tal arithmetic, the basic operations [illegible] is and fractions, proportions a[illegible]			x	x	x
3. Develop proficiencies [illegible] ng, measuring and in using basic s[illegible] cepts.	x	x			x

ACTIVITY #1
The "Akamai" Shopper
Introduction To Spreadsheets

Subject:

Mathematics - Data Display

Computer Literacy Student Expectation(s):

1.1.5. Experiments as a user
1.1.6. Responds to error messages
1.2.4. Recognizes computer processes
1.5.1. Seeks work/play with computer
3.2.1. Identifies applications
3.3.1. Values efficient information processing
4.2.1. Describes how computers assist people

Instructional Mode:

Tool/Topic

Prerequisite(s):

Students should be familiar with the operation of the microcomputer and the various keys on the keyboard.

Classroom Management:

A lab setting with two students per computer would be ideal however groups of four students per computer would be manageable.

Material(s):

Microcomputers.
Spreadsheet program, such as Multiplan or Electronic Spreadsheet.
Handout: Akamai Shopper's Worksheet. (A sample worksheet follows this activity.)
Play money.
Various consumer goods.

Time for Activity:

One to two class periods.

Teacher Preparation:

Become familiar with the spreadsheet program and manual. Based on the sample worksheet, prepare a simple spreadsheet on a data diskette for each computer. The spreadsheet should be set up so that the students will simply modify values already entered.

Sequence of Activities:

1. The setting for this activity is a game situation. The game is designed to test students' awareness of the cost of various items that they use or consume daily. In order to be "akamai" or smart shoppers, the students need to be able to recognize bargains. They can do this only if they are aware of the approximate retail cost of a particular item which may go on sale later. The object is to make purchases or acquire assets with the least amount of cash possible. The team ending up with the highest value of assets wins the game.

2. Arrange students in pairs or groups of four. One member will be the spokesperson while another will be the treasurer. Select one student in the class to serve as the "storekeeper". Each group will be given $10.00 worth of play money with which to bid and make purchases. Distribute the Akamai Shopper's Worksheet handout, on which students can make adjustments for their purchases.

3. Auction off fifteen items in succession to the highest bidder. Before bidding begins:

   a) Give a careful description of the item, i.e. its quantity or weight, its brand name and the store from which it was purchased.

   b) Have each team come to a concensus as to the price of the item or the highest price they will be willing to spend for the item.

4. After all fifteen items are "sold," allow five minutes for the groups to barter or swap the items they "bought" with items "bought" by other groups.

5. The winner of the game will be determined by the value of the asset that each group possesses. The value of the asset will be the balance of the cash the group has plus the actual retail price of the items they "bought". (That is, if the students paid $3 for an item that costs only $2, the actual value of their asset is $2, which means they wasted $1 in making the purchase.) The students will use a spreadsheet program to enter adjustments for their purchases, total their assets, and thus determine the winner.

6. Discuss with the students what a spreadsheet is and its usefulness. Familiarize them with the spreadsheet program they will be using.

7. Have the students boot the spreadsheet program and load the "Akamai Shopper" worksheet.

   a. The students should change (by overstriking) the value of the cash they have on hand. They should then change the value of each item that they purchased. The teacher should provide the actual retail cost of the items.

b. Point out that the TOTAL changes with each revision of the cost of the various items. A formula, such as @SUM(B1..B13), for calculating the total should be provided to the students.

c. The winner of the game is the group with the highest total.

8. Have the students experiment with the various features of the spreadsheet. For example, the items listed can be sorted so that they appear in alphabetical order, another item can be inserted or one can be deleted.

9. Have the students save their worksheets to compare assets and discover the "winning" team.

TEAM_____

AKAMAI SHOPPER'S WORKSHEET

	A	B
1	CASH	$10.00
2	SOAP	$0.00
3	VIENNA SAUSAGE	$0.00
4	TOOTHPASTE	$0.00
5	TOILET TISSUE	$0.00
6	SPAM	$0.00
7	PORK AND BEANS	$0.00
8	CAMPBELL'S SOUP	$0.00
9	BREAD	$0.00
10	COOKIES	$0.00
11	SODA	$0.00
12	MILK	$0.00
13	POTATO CHIPS	$0.00
14		
15	TOTAL	$10.00

ACTIVITY #2
Price Comparisons
Introduction to Spreadsheets

Subject:

Mathematics - Data Analysis

Computer Literacy Student Expectation(s):

1.1.3. Uses basic control keys/commands
1.1.5. Experiments as a user
1.1.6. Responds to error messages
1.2.4. Recognizes computer processes
1.5.1. Seeks work/play with computer
2.1.4. Describes problem solving/decision making process
3.2.1. Identifies applications
3.3.1. Values efficient information processing
4.2.1. Describes how computers assist people

Instructional Mode:

Tool/Topic

Prerequisite(s):

Students should be familiar with the operation of the microcomputer and the various keys on the keyboard.

Classroom Management:

A lab setting with two students at each computer would be ideal; however, groups of three or four are manageable.

Material(s):

Microcomputers.
Overhead projector or computer system with a large screen monitor for demonstration purposes.
Spreadsheet program, such as Multiplan or Electronic Spreadsheet.
Handouts: (Samples follow this activity.)
- Price Comparison Worksheet; (Handout #1);
- Price Comparison Questions; (Handout #2).
Newspaper, such as "Midweek" magazine.

Time for Activity:

One to two class periods.

Teacher Preparation:

Familiarize yourself with the spreadsheet program and manual. Based on the sample worksheet, prepare a spreadsheet on a data diskette for each

computer. Arrange to have copies of the same issue of "Midweek" for each student pair.

Sequence of Activities:

1. This activity is designed to utilize the newspaper and a spreadsheet to do price comparisons at various supermarkets during a given week. The students will change the prices of various items on a spreadsheet using the sale prices they find in the newspaper and write summaries on their findings. The purpose of this lesson is to make the students aware of advertisements which are available to consumers to help them make the best buys. In addition, the students will make a practical application of mathematics in the real world.

2. Begin the sequence of activities by discussing with the students what a spreadsheet is and its usefulness. Clarify and demonstrate with an overhead projector or a large-screen monitor the features of the spreadsheet program the students will be using. Point out the rows, columns and necessary commands, such as an alpha sort.

3. Distribute Handout #1 - Price Comparison Worksheet and have the students boot the spreadsheet program and load the "Price Comparison" spreadsheet. Have them sort the items alphabetically for easier reference. They are to refer to the ads of the supermarkets shown and change the prices of the various items that are on sale. Students may use the worksheet to record price changes before entering these new prices on the spreadsheet.

4. Give instructions for finding unit prices using the value function, if the items are sold in quantities of 2 or more. Show the students how to determine the total costs of the items at each of the supermarkets, using a formula, such as @SUM(C3..C21). Have the students save and print their spreadsheet, then write a summary of their findings by completing Handout #2 - Price Comparison Questions.

5. Discuss the limitations of the results of the survey, i.e., the prices may vary from week to week thereby altering the results each week. Hence, conclusions as to the most economical store can only be determined over a prolonged period of time.

6. Extensions of the lesson can be done by expanding the spreadsheet to show how inflation affects the prices of the various consumer goods. Another application would be to have students continue the study for two or three more weeks, chart the total costs of each supermarket on a graph and then write summaries of the results.

INTRODUCTION TO
SPREADSHEETS

Handout #1
Price Comparisons

NAME_____

PERIOD_____

DATE_____

PRICE COMPARISON WORKSHEET

	A	B	C	D	E
1	ITEM	QUANTITY	FOODLAND	TIMES	SAFEWAY
2					
3	BEEF, GROUND	1 POUND	$2.39	$2.69	$2.59
4	MAYONNAISE (BEST FOODS)	32 OUNCES	$2.13	$2.29	$2.09
5	TOILET PAPER (SCOT)	4 PACK	$1.63	$1.39	$1.65
6	TUNA (CORAL)	6.5 OUNCES	$0.93	$0.99	$0.99
7	SAUSAGE, VIENNA (LIBBY)	5 OUNCES	$0.53	$0.59	$0.59
8	SPAM	12 OUNCES	$1.59	$1.69	$1.59
9	MILK	1/2 GALLON	$1.66	$1.68	$1.71
10	RICE	25 POUND	$6.99	$6.39	$6.19
11	SUGAR	5 POUND	$1.87	$1.89	$1.88
12	EGGS, ISLAND	1 DOZEN	$1.45	$1.49	$1.25
13	SODA (PEPSI)	6 PACK	$3.13	$2.69	$2.79
14	LETTUCE	1 POUND	$1.29	$1.19	$1.39
15	KETCHUP	32 OUNCES	$2.13	$2.39	$1.95
16	MARGARINE (IMPERIAL)	1 POUND	$1.57	$1.69	$1.83
17	CHICKEN THIGHS (FROZEN)	5 POUNDS	$4.99	$4.83	$4.89
18	PORK AND BEANS	16 OUNCES	$0.53	$0.55	$0.59
19	APPLES (RED DELICIOUS)	1 POUND	$0.99	$0.89	$0.99
20	KLEENEX	250 COUNT	$1.89	$1.99	$1.79
21	CEREAL (FRUIT LOOPS)	15 OUNCES	$3.29	$3.35	$3.39
22					
23	TOTALS		$40.98	$40.66	$40.14

NAME_____

PERIOD_____

DATE_____

Price Comparison Questions

Attach your price comparison spreadsheet to this worksheet and answer the following questions.

1. Which store had the lowest total cost?

2. Which store had the highest total cost?

3. What is the difference in the total costs of the most expensive and the least expensive stores?

4. What conditions should you consider before you decide which store would be the most economical to shop at each week?

   a) Could you make a decision after studying the price over a period of one week? Why?

   b) Would the distance from your home to a supermarket be a factor? Why?

   c) Would other features such as "price cutter cards", cleanliness, and attractive displays affect your decision?

   d) What other factors would affect your decision?

5. Suppose you had a coupon for 25¢ off the price of Best Foods mayonnaise. Complete this table using the prices from your spreadsheet to represent the prices with and without the coupon.

	Without coupon	With coupon
Times	_____	_____
Foodland	_____	_____
Safeway	_____	_____

6. If each of the supermarkets were to increase their prices by 7% because of inflation in 1986, what would the total cost at each store be?

   Times _____

   Foodland _____

   Safeway _____

Bonus:

7. Express the difference between the total costs of the least expensive and the most expensive stores as a percent. (Round to the nearest whole number.) Write your answer as a statement. For example: Foodland's prices are 2% higher than Safeway's.

ACTIVITY #3
Checking Computations on
the Order of Operations

Subject:

Mathematics - Numbers and Operations

Computer Literacy Student Expectation(s):

1.4.2. Operates with words/symbols
1.5.1. Seeks work/play with computer
3.1.2. Describes functions of input, output and processing

Instructional Mode:

Tool

Prerequisite(s):

Entry Level Sample Activity [illegible] Grade 7-8 Guide - How Computers Work (pages 43-45) or some [illegible] experience.

Classroom Management:

A lab setting with two students per computer is recommended.

Material(s):

Chalkboard or easel with felt pens.
Teacher-made handout: Order of Operations Worksheet.
MacMillan Mathematics by Forbes, Thoburn, Bechtel, pages 78-79.

Time for Activity:

One class period.

Teacher Preparation:

Review the reference suggested above, as it applies to BASIC programming.

Sequence of Activities:

1. Review with the students operations used in mathematics and the related symbols used on the computer.

Operation	Symbol	Computer Symbol
Addition	+	+
Subtraction	-	-
Multiplication	x	*
Division	- or /	/

Operation	Symbol	Computer Symbol
	Superscript example	Computer Symbol example
Exponent	5^2	5 2

. Review the order of operations:

a. Parentheses
b. Powers
c. Multiplication and Division
d. Addition and Subtraction

Use sample mathematical expressions which are to be simplified, such as:

$(5 \times 8 - 3 \times 6) + 7$

$(40 - 18) + 7$

$(22) + 7$

29

Computer related keys are:
(5 * 8 - 3 * 6) + 7

In order for the computer to print the answer, the student needs to type the following:
PRINT (5 * 8 - 3 * 6) + 7

Remind students to simplify the mathematical expression according to steps with regard to the order of operation.

5^3

$5 \times 5 \times 5$

25×5

125

Computer related keys are:
5 3

Student needs to enter the statement:
PRINT 5 3

3. Provide a handout, such as the Order of Operations Worksheet, to simplify mathematical expressions, as in the above manner. See the following sample worksheet.

ORDER OF OPERATIONS
WORKSHEET

Handout
Order of Operations

NAME_____

PERIOD_____

DATE_____

Mathematical Expression and Answer	Computer Format using BASIC	Answer
1. $(18 - 6) \div 4$		
2. $3 \times (5 + 4)$		
3. $2^3 + 10$		
4. $20 - 3 \times 5$		
5. $24 \div (4 + 2)$		
6. $(8 - 6)^4 - 10$		
7. $30 + 2 \times 5^2$		
8. $(5 + 7) \div 2 \times 5 - 7$		
9. $(25 - 17) / (1 + 3) \times 7$		
10. $(24 + 3) / 9 + 6 * 4$		

ACTIVITY #4
Writing Simple BASIC Programs for
Commonly Used Equations

Subject:

Mathematics - Formulas and Equations

Computer Literacy Student Expectation(s):

1.1.1. Recognizes computer instructions
1.4.1. Recognizes programming languages
1.4.2. Operates with words/symbols
1.5.1. Seeks work/play with computer

Instructional Mode:

Tutee

Prerequisite(s):

Entry Level Sample Activity #3 from the Grade 7-8 Guide - How Computers Work (pages 43-45) or some comparable experience and Mathematics Sample Activity #3 from the Resource Unit - Checking Computations on the Order of Operations.

Classroom Management:

A lab setting with two students per computer is recommended.

Material(s):

Chalkboard or easel with felt perns.
Teacher-made handout: Computer-Calculated Equations Worksheet.
MacMillan Mathematics by Forbes, Thoburn, Bechtel, pages 78-79.
Spotlight on Computer Literacy by Richman, pages 82-117.

Time for Activity:

One class period.

Teacher Preparation:

Review the references suggested above, especially the one by Richman on the basics of BASIC.

Sequence of Activities:

1. Review with the students, following a unit of learning to substitute values into an equation. Explain that values for the variables may be stored into the computer memory.

a. Present the following program; explain how the computer will compute the value:

```
10 LET π = 3.14
20 LET R = 4
30 LET A = π * R ↑ 2
40 PRINT "THE AREA OF THIS CIRCLE IS ";A
50 END
```

Show how changing the value of R in line 20 will result in the area of the new circle.

b. A second example may be explained:

```
10 LET L = 347
20 LET W = 972
30 LET A = L * W
40 PRINT "THE AREA OF THIS RECTANGLE IS ";A
50 END
```

Demonstrate how changing the values of L and W in lines 10 and 20 will result in the new area.

2. Assign students to write programs for given equations and substitutions, then type the programs into the computer and finally record the answers.

A sample handout of some of the equations and substitutions is provided in the handout - Computer-Calculated Equatio Worksheet.

COMPUTER-CALCULATED
EQUATIONS WORKSHEET

Handout
Commonly Used Equations

NAME_____

PERIOD_____

DATE_____

Equations	Values for the Variables	Computer-calculated Answers
1. $P = 2l + 2w$	a.) l = 962.8m, w = 379.63m b.) l = 435.90cm, w = 105.37cm c.) l = 8.963m, w = 7.536m	
2. $C = \pi d$	a.) π = 3.14, d = 36 b.) π = 3.14, d = 628 c.) π = 3.14, d = 33.1	
3. $A = 1/2h(a + b)$	a.) h = 12, a = 7, b = 9 b.) h = 7, a = 12, b = 6 c.) h = 3, a = 7, b = 5	
4. $V = l \times w \times h$	a.) l = 9.7cm, w = 3.8cm, h = 4.7cm b.) l = 56cm, w = 21cm, h = 32cm c.) l = 14.5cm, w = 9.6cm, h = 10.9cm	
5. $V = \pi r^2 h$	a.) π = 3.14, r = 1.5cm, h = 2cm b.) π = 3.14, r = 3cm, h = 4.6cm c.) π = 3.14, r = 6cm, h = 5.5cm	

ACTIVITY #5
Using the Computer to do
Multiplication Calculations

Subject:

Mathematics - Numbers and Operations

Computer Literacy Student Expectation(s):

1.1.1. Recognizes computer instructions
1.4.1. Recognizes programming languages
1.4.2. Operates with words/symbo
1.5.1. Seeks work/play with com
3.2.1 Identifies applications
4.2.1. Describes how computers a people

Instructional Mode:

Topic/Tool/Tutee

Prerequisite(s):

- Entry Level Sample Activity #3 from the Grade 7-8 Guide - How Computers Work (pages 43-45) or some comparable experience.
- Mathematics Sample Activity #3 from the Resource Unit - Checking Computations on the Order of Operations.
- Mathematics Sample Activity #4 from the Resource Unit - Writing Simple BASIC Programs for Commonly Used Equations.

Classroom Mangement:

A lab setting with two students per computer is recommended.

Material(s):

Chalkboard or easel with felt pens.
MacMillan Mathematics by Forbes, Thoburn, Bechtel, pages 78-79.
Spotlight on Computer Literacy by Richman, pages 82-117.

Time for Activity:

One to two class periods.

Teacher Preparation:

Review the references suggested above. Contact a federal or state employment office for current wages of specific jobs.

Sequence of Activities:

1. Draw the following chart on the chalkboard:

WAGES

NO. OF HOURS	HOURLY	WEEKLY	MONTHLY	YEARLY
35	3.75			
40	5.50			
40	15.45			
38	24.75			
32	37.80			

2. Write this computer program on the board, explain what will happen when program is run.

```
10  PRINT "My Weekly Salary Is $"
20  PRINT 35*3.75
30  END
```

3. Discuss hourly wages of various jobs. Fill in the number of hours and hourly wage columns based on information from the discussion.

4. Discuss with the students how the program could be changed to continue filling out the weekly column:

   a. Line 20 could be changed accordingly;

   b. The concept of variables could be discussed and a formula provided; READ/DATA and FOR/NEXT statements could then be introduced, resulting in a mini-program, such as:

```
10  FOR X = 1 TO 5
20  READ H,W
30  LET A = H * W
40  Print "My Weekly Salary Is $";A
50  NEXT X
60  DATA 35,3.75,40,5.50,40,15.45,38,24.75,32,37.80
70  END
```

5. Similarly discuss how the monthly and yearly columns could be changed. Allow students time to complete the chart and try to develop a BASIC program for facilitating the calculations. Remind students about the order of operations in mathematical expressions.

SAMPLE ACTIVITIES
SCIENCE

SCIENCE COURSE CONTENT OBJECTIVES

At the intermediate school level one year of science is required. Schools must offer course choices identified under the Minimum Electives in the secondary science curriculum. Usually Science, FAST I or Life Science are offered at grade 7, while Science, FAST II and Earth-Space Science are offered at grade 8. All four courses are laboratory-oriented to develop inquiry skills and an understanding of the process of science. The intermediate program, as part of the K-12 science curriculum, aims to reinforce and extend a student's ability to deal with bio-physical phenomena using the following hierarchy of skills:

1. Observe using senses appropriate to the desired data.
2. Classify observations appropriately.
3. Measure accurately.
4. Process data via collecting, recording, organizing and communicating.
5. Evaluate and interpret processed data.
6. Make inferences from interpretations of processed data.
7. Combine the above skills into a personal strategy for experimenting.

Of the Science course content topics/objectives delineated in The Foundation Program's Authorized Courses and Code Numbers (1986-1988) for the intermediate courses, (pages I-6 to I-8), three in particular are addressed by the following sample activities. Because the scientific process is a theme throughout these science courses, sample activities #2 and #3 do address this concern, while sample activity #4 can reinforce vocabulary in all courses. The chart below summarizes the course content topics/objectives reinforced by the activities.

Course Content Topics/Objectives	Sample Activities #1	#2	#3	#4
Science, FAST I				
Buoyancy (Density).	x			
Nature of Scientific Knowledge.	x	x	x	
Scientific Process.	x	x	x	
Scientific Literacy.				x
Sciences, FAST II				
Nature of Scientific Knowledge.		x	x	
Scientific Process.		x	x	
Scientific Literacy.				x

Course Content Topics/Objectives	Sample Activities #1	#2	#3	#4
Life Science				
Scientific Process.		x	x	
Scientific Literacy.				x
Earth-Space Science				
Scientific Process.		x	x	
Scientific Literacy.				x

SAMPLE ACTIVITY #1
Density of Objects

Subject:

Science - Physical Science

Computer Literacy Student Expectation(s):

1.1.1. Recognizes computer instructions
1.1.3. Uses control keys/commands
1.1.5. Experiments as a user
1.2.3. Sequences process steps
1.2.4. Recognizes computer processes
1.5.1. Seeks work/play with computer
1.5.2. Uses positive affect words
2.1.1. Uses computer in decision making
3.3.1. Values efficient information processing

Instructional Mode:

Tool/topic

Prerequisite(s):

Students should be familiar with computers. They should have done problems related to buoyancy and have completed an experiment on finding densities of various objects. Students should have knowledge of the equation, D = M/V.

Classroom Management:

Two students per computer is recommended. Each student should have a copy of the class data. An overhead projector is recommended to help guide the students through the program.

Material(s):

Microcomputers and printer.
Spreadsheet program, such as Multiplan or Electronic Spreadsheet.
Overhead projector and blank transparencies.
Teacher-made handouts: (Samples are provided.)
- Class Data Density of Objects (for hand written entries); (Handout #1);
- Class Data Density of Objects (computer printout of sorted class data); (Handout #2).

Text: FAST I, University of Hawaii, Problems 1 through 12, pages 10-40.

Time for Activity:

Five class periods are needed, if students are to type data into the computer. Two class periods are needed, if data is typed by the teacher and copied onto the students' diskettes.

Teacher Preparation:

Become very familiar with the spreadsheet program.

If TRS-80 version of Multiplan is used, Multiplan Boot and System are on one diskette, which means that there is very limited available space on this diskette. Therefore, only one class data table can be written on a diskette.

If Apple IIe version of Multiplan is used, the System diskette can hold three or four class data tables.

Sequence of Activities:

1. Review the general rules and precautions in the computer lab. Explain what a spreadsheet is and discuss what the class is going to do with their data. (The computer and spreadsheet are tools that will calculate and organize the data quickly and efficiently. This then will help students to analyze their data.)

2. Give students instructions on how to create the spreadsheet and enter their data. It is best to talk them through one command at a time as needed. Use the overhead projector as an aid in discussing such commands as:

   a. ALPHA to type headings;

   b. FORMAT to adjust column width;

   c. TRANSFER SAVE to save after a few entries;

   d. COPY to draw lines.

3. (Handout #1 - Class Data Density of Objects, for hand-written entries, should have been distributed earlier for team recordings during the science experiment.) After students have finished entering data on the spreadsheet, have them compute densities.

   a. Use the VALUE command to enter the formula for density. Compute about three to four individual cells until students understand the formula, D = M/V.

   b. After students compute densities individually, show them how the rest of the computations can be done quickly with the COPY command.

   c. Use the FORMAT command to round off densities to the nearest hundredths.

4. When all the densities have been computed, use the SORT command on the density column for an ascending order. Have students study the sorted table. Point out that most of the floating objects are located at the top of the sheet, and the sinking objects are at the bottom. (See the sample printout of sorted class data, following this activity.)

5. Discuss the possible kinds of experimental errors that could have produced unreasonable data. Point out that densities of objects that are equal or nearly so may be an indication that these objects are made of the same type of materials.

6. A printout of the sorted data should be made and given to each student as part of his/her laboratory report and to be used for further discussions. Handout #2 - Class Data Density of Objects is a sample printout of sorted class data.

CLASS DATA DENSITY OF OBJECTS

PROBLEM P-10:

GROUP	KIND OF OBJECT	MASS OF OBJECT(G)	VOLUME OF OBJECT(ML)	DENSITY OF OBJECT(G/ML)

CLASS DATA DENSITY OF OBJECTS

PROBLEM P-10:

GROUP	KIND OF OBJECT	MASS OF OBJECT(G)	VOLUME OF OBJECT (ML)	DENSITY OF OBJECT(G/ML)
SCYULLA	FLOAT	3.40	32	0.11
CHURA	SINK	7.09	40	0.18
CHURA	FLOAT	6.05	34	0.18
JUANITA	FLOAT	2.50	14	0.18
CHURA	FLOAT	8.17	45	0.18
ROXANNE	FLOAT	8.70	41	0.21
FRELLIE	FLOAT	6.02	27	0.22
CHURA	FLOAT	8.00	33	0.24
SHERRY	FLOAT	6.03	24	0.25
HEIDI R	FLOAT	5.94	23	0.26
JUANITA	FLOAT	6.80	23	0.30
HEIDI R	FLOAT	4.25	14	0.30
JUANITA	FLOAT	7.50	23	0.33
SHERRY	SINK	1.65	5	0.33
SCYULLA	FLOAT	2.70	7	0.39
CHRIS H	FLOAT	6.08	14	0.43
SHERRY	FLOAT	3.07	7	0.44
ROXANNE	SINK	8.10	16	0.51
CHRIS H	FLOAT	14.70	28	0.53
HEIDI R	FLOAT	9.27	15	0.62
ROXANNE	FLOAT	16.90	27	0.63
ROXANNE	FLOAT	9.10	14	0.65
SCYULLA	FLOAT	15.74	23	0.68
FERMINA	FLOAT	9.04	13	0.70
JUANITA	FLOAT	9.50	13	0.73
CHURA	FLOAT	9.06	12	0.76
ROXANNE	FLOAT	20.00	25	0.80
FRELLIE	FLOAT	12.34	14	0.88
FERMINA	FLOAT	12.74	14	0.91
FERMINA	FLOAT	18.28	20	0.91
SCYULLA	SINK	20.50	20	1.03
FRELLIE	FLOAT	2.00	2	1.05
SHERRY	SINK	6.70	6	1.12
FRELLIE	SINK	7.02	6	1.17
CHRIS H	SINK	20.05	17	1.18
JUANITA	SINK	7.90	6	1.32
FERMINA	SINK	7.00	5	1.40
JUANITA	SINK	7.10	5	1.42
SHERRY	SINK	4.41	3	1.47
CHRIS H	SINK	17.80	11	1.62
CHRIS H	SINK	21.40	13	1.65
SHERRY	SINK	9.74	5	1.95
FERMINA	SINK	8.12	4	2.03
SCYULLA	SINK	35.90	14	2.56
FRELLIE	SINK	19.05	7	2.72

Density of Objects

GROUP	KIND OF OBJECT	MASS OF OBJECT(G)	VOLUME OF OBJECT(ML)	DENSITY OF OBJECT(G/ML)
CHRIS H	SINK	55.05	13	4.23
HEIDI R	SINK	9.74	2	4.87
ROXANNE	SINK	9.90	2	4.95
HEIDI R	SINK	55.83	11	5.08
CHURA	SINK	5.60	9	6.22
FERMINA	SINK	19.10	3	6.37
HEIDI R	SINK	18.93	2	9.47
FRELLIE	SINK	19.64	2	9.82
SCYULLA	SINK	19.70	2	9.85

SAMPLE ACTIVITY
Mapping Data

Subject:

Science - . ical Science

Comp ter Litera tudent Expectation(s):

1.1.2. Reads instructions, keyboard, output
1.1.5. Experiments as a user
1.5.1. Seeks work/play with computer
1.5.2. Uses positive affect words
2.1.1. Uses compute in decision making

Instructional Mod.

Tutor/Tool

Prerequisite(s):

None

Classroom Management:

One microcomputer should be available fo class demonstration purposes. There should also be a computer lab with four or more computers capable of running the demonstrated software. A full computer lab with two to three students per machine is preferable.

Material(s):

Microcomputer(s).
Printers, mouse and/or joystick inputs are optional.
Overhead projector is optional.
Teacher-made handouts: (Samples are provided.)
- Intro to Graphs using Zork I; (Handout #1);
- Sample Map, ing Zork I; (Handout #2).

Any simulation soft re that generates a non-variable two-dimensional playing area. Many adventure and fantasy games may be utilized to generate student interest and activity. Text based programs, such as Enchanter and Zork series by Infocom, should be reserved for advanced players and those with good written communication skills. Mixed text and graphics programs, such as Snooper Troops and In Search of the Most Amazing Thing by Spinnaker, may be used by students at all levels.

Time for Activity:

One class period for demonstration and introduction to mapping; two to ten class periods for student work, depending on number of microcomputers available.

Teacher Preparation:

Read the documentation that comes with the software you plan to use and pretest the program with projected student input. Prepare the needed handouts.

Sequence of Activities:

1. Introduce students to program initialization and keyboard or other input device.

2. Introduce concepts of two-dimensional arrays and the use of symbols in representing experimental and natural observations through maps and graphs. Provide a handout introducing the software to be used, such as Handout #1 - Intro to Graphs, using Zork I.

3. Using full class input, begin exploration of simulation playing area and record observations on overhead transparency.

4. Copy the class generated transparency for individual or small group activities to complete a map of the entire playing area available. Depending on the software utilized, individual or lab groups may be assigned specific areas to explore in preparation for a class-generated map. See Handout #2 - Sample Map, using Zork I.

5. Advanced students may be given scouting assignments to select areas for group explorations. Optional or long term projects may include creation of simple text and graphics adventures in Pascal, BASIC or other structured programming language.

INTRO TO GRAPHS
USING ZORK I

Handout #1
Page 1 of 2
Mapping Data

NAME_____

PERIOD_____

DATE_____

Making Maps from Written Information

Maps are a form of graph used by scientists to describe a place in picture form. In this assignment you will use an adventure program to travel in a fantasy world and your own skills to create a map, which will help others to know about your travels. While commonly used by many non-scientists as well, maps are an excellent way of recording data in a simple, organized manner.

DIRECTIONS AND ABBREVIATIONS

North	South	East	West	NorthEast	SouthEast	NorthWest	SouthWest
N	S	E	W	NE	SE	NW	SW

Up	Down
U	D

COMMANDS AND ABBREVIATIONS

AGAIN Repeat the last command.
BRIEF, VERBOSE, SUPERBRIEF Determine how much information ZORK will give you when you enter a room or location. Use VERBOSE until you are very familiar with the map.
DIAGNOSE Get a medical report on your condition after a battle.
INVENTORY List what you are carrying.
LOOK Describe your location in detail.
QUIT Leave the program and go to DOS. SAVE FIRST.
RESTORE Return to a position you have earlier saved.
SAVE Store your position and possessions before you quit, so that you can come back to the same place next time. Also very useful before entering dangerous situations, just in case you die.

RECOGNIZED VERBS

Use in sentences to direct the program action. Every sentence must have a verb and a noun. Spelling counts! Examples: TOUCH the Mirror, OPEN the Trap Door, CLIMB down the Rope.

ANSWER	ATTACK	BLOW	BREAK	BURN	CLIMB	CLOSE
COUNT	CROSS	CUT	DEFLATE	DIG	DRINK	DROP
EAT	ENTER	EXAMINE	EXIT	EXTINGUISH	FILL	FOLLOW
GIVE	INFLATE	JUMP	KICK	KNOCK	LIGHT	LISTEN
LOCK	LOOK	LOWER	MOVE	OPEN	POUR	PRAY
PULL	PUSH	PUT	RAISE	READ	SAY	SEARCH
SHAKE	SLIDE	SMELL	STAY	STRIKE	SWIM	TAKE
TELL	THROW	TIE	TOUCH	TURN	UNLOCK	WAKE
WALK	WAVE	WEAR	WIND			

ASSIGNMENT

Use the map started with the full class and move through the program in order to answer the following questions.

1. In what direction is the house from the mailbox? _____

2. What directions must you follow to move from the kitchen to the gallery? _____

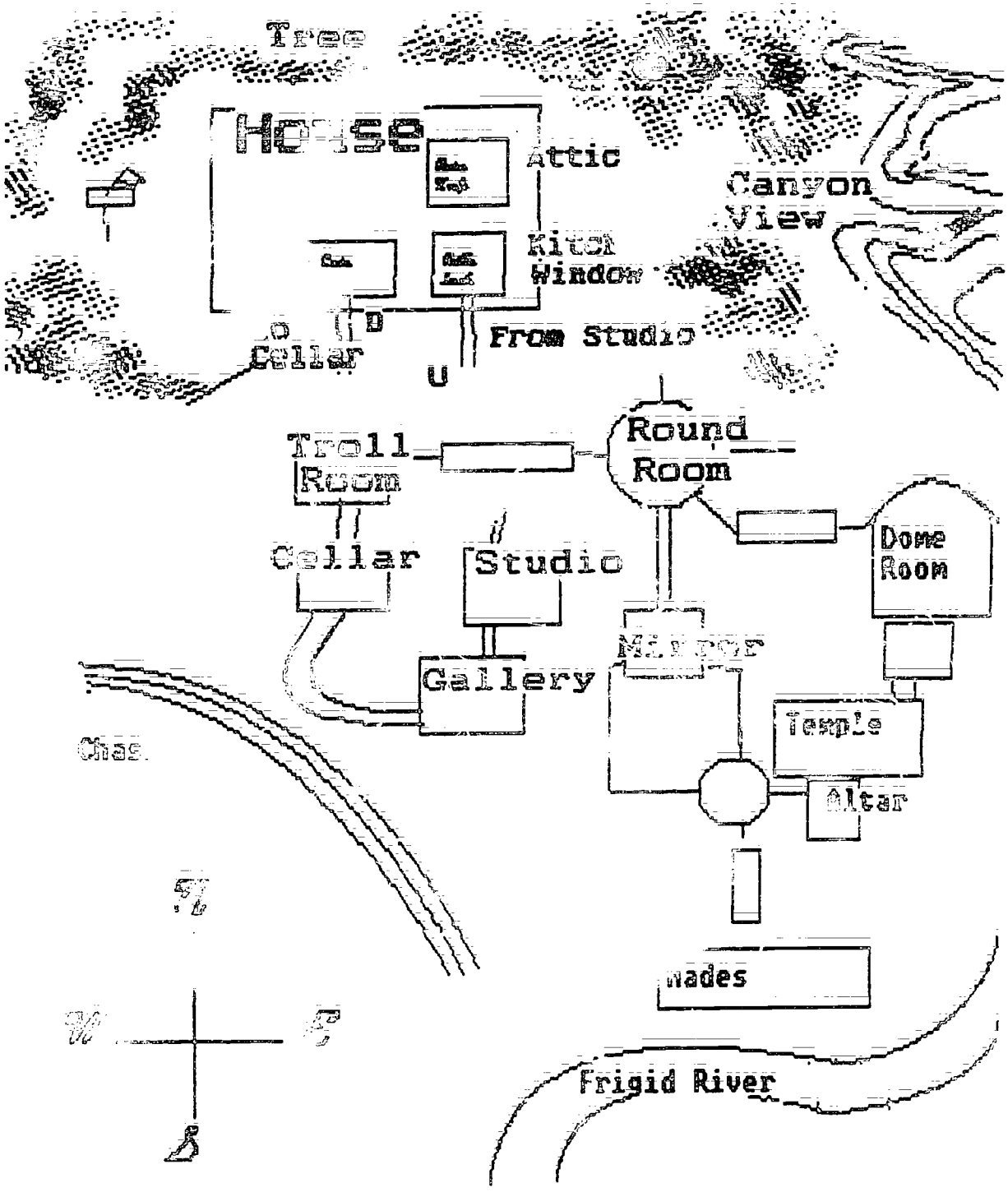
3. What happens if you touch the mirror? _____

4. Once you do down to the cellar, how can you get back to the kitchen? _____

Find five objects and five rooms or locations not on the class map, and make your own map to add on to the class map.

SAMPLE MAP
USING ZORK I

Handout #2
Mapping Data



S ACTIVITY #3
D a Data Table

Subject:

Science - Physical Science

Computer Literacy Student Expectation(s):

1.2.2. Determines structural components
1.2.4. Recognizes computer processes
1.4.2. Recognizes words or symbols that operate the computer
2.1.1. Use the computer in decision making
3.3.1. Values efficient information processing

Instructional Mode:

Tool

Prerequisite(s):

Students should be familiar with computer keyboard and cursor control, and should also have had some lab experience in collecting data.

Classroom Management:

One microcomputer should be available for class demonstration purposes. There should also be a computer lab with four or more computers capable of running the demonstrated software. A full computer lab with two to three students per machine is preferable.

Material(s):

Microcomputer(s).
Printer.
Teacher-made handouts: (Samples are provided.)
- Sample Data Table; (Handout #1);
- Sample Data Table in Formula Mode; (Handout #2).
Any spreadsheet, data base or text program. Spreadsheet or integrated programs will allow data manipulation for future assignments.

Time for Activity:

One class period for introduction to data arrays and labeling (for future reference); one to ten class periods for student input of collected data. One class period for analysis of student output and review.

Teacher Preparation:

Read the documentation that comes with the software you plan to use and pretest the program with projected student input. Prepare the needed handouts.

Sequence of Activities:

1. Introduce data labeling and alignment in arrays through a simple lab experiment, such as "Change in Mass."

2. Demonstrate program initialization, data entry and printer control. Provide Handout #1 - Sample Data Table and Handout #2 - Sample Data Table in Formula Mode.

3. Allow students to work in lab groups or as individuals, depending on the number of microcomputers available.

4. Students should be encouraged to use available computers for data entry on all future labs.

SAMPLE DATA TABLE

Handout #1
Data Table

NAME_____

PERIOD_____

DATE_____

This data table shows sample mass v[illegible] lab on change in mass; using a simple experiment of total mas[illegible] system consisting of NaCl; H_2O and a closed container before and af[illegible] mixing. The following handout shows the same data table in formula mode.

	A	B	C	D	E	F	G	H	I
1		BUILD A DATA TABLE							
2									
3	SAMPLE DATA	CHANGE IN MASS OF A DISSOLVED SALT							
4									
5	TRIAL	MASS BEFORE	MASS AFTER	CHANGE IN					
6	#	MIXING (g)	MIXING (g)	MASS (g)					
7		32.17	32.24	.07					
8		29.57	28.93	-.64					
9		28.67	28.67	.00					
10	4	36.02	36.02	.00					
11	5	27.67	27.64	-.03					
12		31.55	31.55	.00					
13	7	31.45	31.43	-.02					
14	8	35.12	35.12	.00					
15	9	31.45	31.45	.00					
16	10	28.69	28.67	-.02					
17									
18									

SAMPLE DATA TABLE IN FORMULA MODE

Handout #2
Data Table

NAME_____

PERIOD_____

DATE_____

Data table example in formula mode with instructions for creation.

	A	B	C	D	E	F	G	H	I
1		* BUILD A DATA TABLE							
2									
3	"SAMPLE DATA CHANGE IN MASS OF A DISSOLVED SALT								
4									
5	"TRIAL	"MASS BEFORE	"MASS AFTER	"CHANGE IN					
6	" #	"MIXING (g)	"MIXING (g)	"MASS (g)					
7	1	32.17	32.24	@D7-B7					
8	@A7+1	29.57	28.93	@D8-B8					
9	@A8+1	28.67	28.67	@D9-B9					
10	@A9+1	36.02	36.02	@D10-B10					
11	@A10+1	27.67	27.64	@D11-B11					
12	@A11+1	31.55	31.55	@D12-B12					
13	@A12+1	31.45	31.43	@D13-B13					
14	@A13+1	35.12	35.12	@D14-B14					
15	@A14+1	31.45	31.45	@D15-B15					
16	@A15+1	28.69	28.67	@D16-B16					
17									
18									
19	"STEPS								
20	1	"Global Manual (/GM) prevents automatic recalculations.							
21	@A20+1	"Move cursor to header area and enter title and headings.							
22	@A21+1	"In cell A7 enter the number 1.							
23	@A22+1	"Move cursor to A8							
24	@A23+1	"Enter the formula @A7+1 and replicate (/R) through A16							
25	@A24+1	"Enter the data for the first trial.							
26	@A25+1	"Move to F7 and enter the formula @D7-B7							
27	@A26+1	"Replicate F7 through F16							
28	@A27+1	"Enter remaining data							
29	@A28+1	"Edit (/E) to manually recalculate data							
30	@A29+1	"Global Formula (/GF) to show formulas or results							
31									
32									
33									

SAMPLE ACTIVITY #4
Scientific Vocabulary

Subject:

Science - Physical Science

Computer Literacy Student Expectation(s):

1.1.4. Selects/Uses written resources
3.3.4. Values communication/information

Instructional Mode:

Tool/Topic

Prerequisite(s):

Science Sample Activity #2 from the Resource Unit - Mapping Data or some comparable experience.

Classroom Management:

This activity requires some student familiarity with the microcomputer. Vocabulary puzzles may be completed as homework for the full class or as review for selected students. If students are to prepare their own word puzzles, at least one computer should be available in the classroom or other accessible location.

Material(s):

Microcomputer(s).
Printer. A print enhancer utility such as Fancy-Fonts by SoftCraft or Niceprint by Spies Labs is beneficial in producing photocopy or mimeograph reproduction quality output.
Teacher-made handouts: (Samples are provided.)
- Intro to Word Puzzles Software; (Handout #1);
- Sample Computer-Generated Cryptogram; (Handout #2);
- Sample Computer-Generated Answers to Cryptogram; (Handout #3).

MECC Puzzles and Posters (formerly titled MECC Teachers' Utility Disk).

Time for Activity:

Parts of several class periods to collect vocabulary for review; one class period for introduction of word puzzles. Continuing portions of class periods for vocabulary compilation and student-generated puzzles.

Teacher Preparation:

Read the documentation that comes with the software you plan to use and pretest the program with projected student input. Prepare the needed handouts.

Sequence of Activities:

1. Collect vocabulary terms from class activities and enter into database portion of the MECC program.

2. Generate a word puzzle for rev[illegible] section vocab[illegible]ry. Have students define each te[illegible] answer question [illegible]eet to deter[illegible]ds in list.

3. Sh[illegible]s how computer-generated puzzles [illegible] Encourage[illegible] to maintain their o[illegible] vocabulary lis[illegible]ned and related science/technology rea[illegible]ings and creat[illegible]s from their database. Provide handouts, such as: H[illegible]ntro to Word Puzzles Software; Handout #2 - Sample Co[illegible]ted Cryptogram; and Handout #3 - Sample Computer-Ge[illegible]nswers to Cryptogram.

INTRO TO WORD PUZZLES SOFTWARE

Handout #1
Scientific Vocabulary

NAME _____

PERIOD _____

DATE _____

INSTRUCTIONS FOR FILE CREATION: Using MECC Puzzles and Posters - WORD SEARCH

Load the MECC Diskette. When the graphic appears, you need to press the Space Bar to continue to the menu.

Format a Data Diskette, if you have not already done so. Select number 5 on the main menu.

Select WORD FIND on the main menu.

Select CREATE A FILE on the submenu, if you do not already have a file.

Select PRINT A FILE on the submenu, if you have a file loaded. You will be prompted to insert your data disk and told to select a file name. Pressing the enter key will display a directory of available files.

MECC programs are entirely menu driven and will prompt you as needed throughout the program. There is no way to by-pass the menus, nor is there any mechanism for using print enhancement programs or other DOS utilities, since MECC runs outside of DOS and requires a warm boot to exit.

SAMPLE COMPUTER-GENERATED
CRYPTOGRAM

Handout #2
Scientific Vocabulary

NAME _____

PERIOD _____

DATE _____

Can you find the twenty words hidden in this puzzle?
(The symbols indicate direction of location.)

CRYSTALLIZATION	CHROMATOGRAPHY	SEPARATION	EXPERIMENT
EVAPORATE	INSOLUBLE	CONDENSE	DISSOLVE
FRACTION	FREEZING	PROPERTY	DISTILL
LIQUEFY	MIXTURE	SOLUBLE	DENSITY
FILTER	BOIL	MELT	PURE

R-100

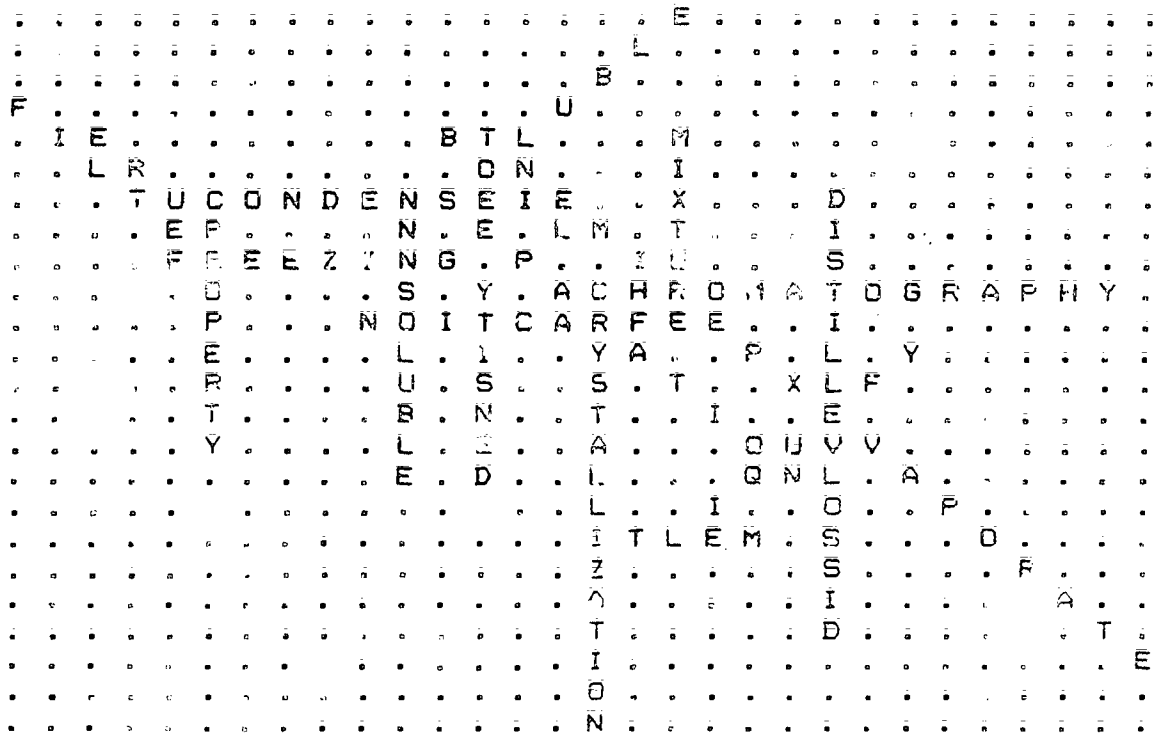
SAMPLE COMPUTER-GENERATED
ANSWERS TO CRYPTOGRAM

Handout #3
Scientific Vocabulary

NAME_____

PERIOD_____

DATE_____



Words:

CRYSTALLIZATION	CHROMATOGRAPHY	SEPARATION	EXPERIMENT
EVAPORATE	INSOLUBLE	CONDENSE	DISSOLVE
FRACTION	FREEZING	PROPERTY	DISTILL
LIQUEFY	MIXTURE	SOLUBLE	DENSITY
FILTER	BOIL	MELT	PURE

SAMPLE ACTIVITIES
SOCIAL STUDIES

SOCIAL STUDIES COURSE CONTENT OBJECTIVES

At the intermediate school level two one-year courses, The Hawaiian Monarchy (Grade 7) and America's Heritage People and Problems (Grade 8) are required. The general objectives of the Secondary Social Studies Program are for students, in increasing depth and scope, to:

1. Identify and use historical and social science knowledge and modes of inquiry in understanding the historical development of people and society.

2. Demonstrate skill in identifying and analyzing issues and problems concerning people and society.

3. Demonstrate the ability to use decision-making and problem-solving processes as related to issues and problems of people and society.

4. Develop attitudes and values based on the use of rational processes in problem solving and decision making.

5. Demonstrate knowledge and understanding that reflect social responsibility to self and others.

Of the Social Studies course content objectives delineated in The Foundation Program's Authorized Courses and Code Numbers (1986-1988) for the Basic Program, (pages J-6, J-8), six in particular are addressed by the following sample activities. The chart below summarizes the course content objectives reinforced by the activities.

Course Content Objectives	Sample Activities #1	#2	#3	#4
The Hawaiian Monarchy				
2. Identify and describe the development of Hawaii's social, political and economic institutions which evolved in the post-contact period (arrival of Europeans, Captain Cook), until the overthrow of the monarchy and establishment of a Republic.		x		
3. Identify, describe and explain the major periods and movements in Hawaiian history in the post-contact period that influenced the growth and development of Hawaii.		x		
4. Examine the role of Hawaii's monarchs in shaping and changing Hawaiian government and society.		x		
America's Heritage, People and Problems				
1. Define the concept of rights and freedoms of individuals in American society in terms of constitutional rights and liberties.	x		x	

Course Content Objectives	Sample Activities #1	#2	#3	#4
4. Identify the major social problems confronting American society today; describe and explain some probable causes and the effects on the nation and its people.	x		x	
6. Identify significant personal problems confronting oneself today and possibly in the future, describe and explain some probable causes and effects on the individual presently and in the future.				x

SAMPLE ACTIVITY #1
Robot Foul-Up

Subject:

Social Studies - Moral Behavior

Computer Literacy Student Expectation(s):

2.1.1. Uses computer(topic) in decision making
3.3.3. Appreciates economic benefits
3.3.5. Understands effects on ecomonics, politics, crime
4.1.1. Lists limitations
4.2.1. Describes how computers assist people

Instructional Mode:

Topic

Prerequisite(s):

Entry Level Sample Activity #2 from the Grade 7-8 Guide - Robotics (pages 41-42).

Classroom Management:

No classroom microcomputer is needed. Students can discuss the issue as a class and work in teams of three to four to "resolve" the problem.

Material(s):

Handout with the background information on "Robot Foul-Up." (A copy is provided.)

Time for Activity:

One class period.

Teacher Preparation:

Prepare the handout for student use. Be prepared to discuss the overall goal(s) and student expectation(s) of this activity.

Sequence of Activities:

1. Discuss the increasing use of robots within industry and in the home. Have students discuss people's emerging relationship with machines.

2. Clarify the terms, liable and malfunction.

3. Distribute the handout entitled, "Robot Foul-Up." Have the class read it.

4. With one student recording notes on the chalkboard, have the class summarize the main issues of the problem.

5. Divide students into teams of three or four to plan their course of action in advising the family of the deceased as to whom they should hold responsible for the loss of life.

   a. Teams should organize themselves into the roles of leading attorney, legal consultant(s) and recorder.

   b. Each team should present to the class its decision and rationale for such a decision.

Robot Foul-Up Story*

An attorney in Computerville has been placed in a difficult and confusing position. Recently, at the Gmord Motor Company, a robot "killed" a worker. Obviously, the robot did not consciously kill the worker. However, the worker's family wants to file a law suit. They have requested an attorney to help determine who should be held responsible.

Gmord Motors has maintained it should not be held responsible for the worker's death. Accidents happen on an assembly line. In the past, mishandled machinery resulted in accidents or deaths. Working can be dangerous. Gmord also maintains that it should not be held responsible for an accident which involves a robot. The robot was purchased to do a particular job, and somehow it malfuctioned. Perhaps the manufacturer of the machine, Champ Robots, should be held responsible.

Representatives from the Champ Company maintain that the manufacturer should not be held responsible for the accident. They state that the robot malfuctioned: something that any machine, even a thinking or programmable one can do. The Champ representatives insist that Gmord should have monitored the machine more closely.

The responsibility for the accident may not solely rest on companies. Perhaps individuals should be held responsible for the death of the worker. Mr. Willy designed the robot which malfunctioned. Obviously, the robot was not designed to kill anyone. It was designed to do a particular job. Apparently there was some flaw in the design. However, Mr. Willy could not know about this flaw until the machine was used for a period of time. Mr Willy has maintained that he is always trying to improve his designs. However, scientists must discover how their creations function in the workplace before they can sell them to the public or large companies.

Mr. Gample of Service Ltd., an organization that services robots, maintained that his company should not be held responsible for the death of the worker. Although they service robots, there apparently was no way they could predict that the robot would malfunction and tragically take a person's life. The workers at Service Ltd. cannot read the minds of designers or robots!

The attorney has called you to help him advise the family of the deceased as to whom they should sue.

Questions and Issues to Consider:

1. Whom do you think the family should sue? As a team, write a paper which states who should be held responsible and, ultimately, who should be sued. You must present arguments to substantiate your opinion. Be sure to give reasons why the other parties should not be sued. After

you finish writing your paper, present your reasons to others within your class. Be prepared for a lively debate!

2. Who are some possible defendants in the case?

3. What are the positions of each defendant?

4. What should be done in a factory or by a designer to ensure the safe use of a robot?

5. It is now 2210. Robots are conscious of their existence. Imagine that a robot killed someone. What should be the punishment? Would the punishment in 2210 be different than the punishment in the 1980's? Elaborate on your response.

*From Computer Ethics by Dr. Thomas M. Kemnitz and Philip F. Vincent, pages 17-19; copyright (c) 1985 by Trillium Press, New York, New York. Reproduced with permission.

SAMPLE ACTIVITY #2
Developing a Database for Hawaiian Monarchs

Subject:

Social Studies - Hawaiian Studies

Computer Literacy Student Expectation(s):

1.2.4. Recognizes computer processes
1.5.1. Seeks work/play with computer
1.5.2. Uses positive affect words
2.1.1. Uses computer in decision making
2.1.4. Assists in problem solving/decision making
3.2.1. Identifies applications
3.3.1. Values efficient information processing
3.3.4. Values communication/information
3.3.6. Identifies applications of computer science
4.1.1. Lists limitations
4.2.1. Describes how computers assist people

Instructional Mode:

Tool/Topic

Prerequisite(s):

Students should be familiar with the operation of the microcomputer and be able to use the keyboard comfortably. They should be currently studying the Hawaiian Monarchies in Hawaiian Studies.

Classroom Management:

For the classroom demonstration one microcomputer with a large monitor or two should be used. If two or four microcomputers are available, pairs of students can use them on a rotational basis. Refer to the Activity Guidelines in the Grade 7-8 Guide, (pages 35-36), for further details.

Material(s):

Microcomputers with two disk drives each.
PFS: File or some other program for storing and retrieving data.
Program user manual.
Teacher-made database file for student entries. (Refer to the format for Sample Data File, Hawaiian Monarchs Database, following this activity.)
Resources for reference or text, such as:

- Hawaii's Royal History by H. Wong and R. K. Carey;
- HAWAII - Our Island State by N. W. Potter, L. M. Kasdon and D. Hazama.

Time for Activity:

One week or so, depending on the number of available microcomputers. One period is needed for demonstration, discussion and planning of activity. Two days are best for research in the library and data entry on the computers. One day is needed for completing reports, and the final day is for class discussion and sharing results.

Teacher Preparation:

Spend a few hours experimenting with the program, to become familiar with its operation and documentation. Use the DESIGN function to build a file for data on the Hawaiian monarchs, according to a format similar to the one in the sample data file following this activity.

Add a form to the file for each monarch, filling in only the monarch's name. After students have entered the data on their data disks, be sure to combine their disks into one master disk for the classroom database using the COPY function.

Sequence of Activities:

1. Pose the problem of determining why some of the Hawaiian monarchs were more successful rulers than others. After eliciting hypotheses about the possible reasons, introduce the idea of creating a computerized database of key information for each monarch.

2. Review with the class the terms "database" and "information retrieval." Distinguish the terms field, record and file in a database, using analogies.

3. Have students work in pairs (mostly), assigning one monarch to each.

4. Demonstrate PFS: File (or similar software) and the procedure the students will follow in searching, updating, sorting and printing out the monarch database. Show how and when to use both the program disk and the monarch database disk. Clarify procedures for continuing a search or returning to the main menu.

   a. Run through the specifics of retrieving one monarch, such as Lunalilo, and updating the record by inserting data in one field, Years of the Monarchy.

   b. Clarify the need for entering the full field for numeric entries, such as the years (NNNN-NNNN): 1873-1874. This is known as fixed-length data and is especially important for comparison purposes.

   c. Show how the PRINT function and SORT selection work. Remind students to always check the printer before printing to see if it is on and the paper is properly loaded.

5. Allow students time to research the needed data for their monarch from the school library or classroom reference books. Included in their findings should be their monarch's strengths and weaknesses as a ruler and the major events during his/her monarchy. Discuss possible entries in these areas. When ready, have them enter the data on the database. Signing up for computer time should be a prerequisite for using the equipment.

6. After students have entered their data on their database disk, compile all data forms on the master database disk and provide copies of this updated disk to all teams. Have students sort the file by categories to examine differences and similarities among the monarchs. These comparisons will help students test the validity of their hypotheses about the more successful rulers. Each pair or team of students must prepare a report that supports their hypothesis based on data from the Hawaiian Monarchs Database.

7. Have students present their reports to the class. Allow responses from other students. Discuss the kinds of information they might add to the database to shed more light on the issue. Soon the database will have grown until there are substantial data for other investigations, such as: What were the major factors that contributed to the end of the Hawaiian Monarchies?

8. Introducing the class to a word processor at this time would be appropriate for facilitating report-writing and for increasing computer literacy. Refer to Language Arts Sample Activity #1 from the Grade 7-8 Guide - Beginning Use of Word Processor, (pages 57-60).

SAMPLE DATA FILE
HAWAIIAN MONARCHS DATABASE

Monarch:

Years of the Monarchy (NNNN-NNNN):

Parents:

Offspring:

Relationship with the Hawaiian People:

Strong Points as a Ruler:

Weak Points as a Ruler:

Contributions to Hawaii:

Major Events:

SAMPLE ACTIVITY #3
Top Secret Information

Subject:

Social Studies - Moral Behavior

Computer Literacy Student Expectation(s):

2.1.1. Uses computer (topic) in decision making
3.3.5. Understands effects on economics, politics, crime
4.1.1. Lists limitations
5.1.2. Identifies national/international careers

Instructional Mode:

Topic

Prerequisite(s):

Social Studies Sample Activity #1 from the Grade 7-8 Guide - Computer Crime (pages 93-94) or some comparable experience.

Classroom Management:

No classroom microcomputer is needed. Students can discuss the issue as a class and work in teams of three to four to resolve the problem.

Materials:

Handout with the background information on "Top Secret Information." (A copy is provided.)

Time for Activity:

Two class periods.

Teacher Preparation:

Prepare the handout for student use. Be prepared to discuss the overall goal(s) and student expectation(s) of this activity.

Sequence of Activities:

1. Ask students to name any incidents they have recently read about or heard on the news in which an individual computer-user criminally broke into a larger computer system. Refer to any related news articles previously brought to class.

2. Have students discuss whether there is ever any moral justification for a criminal act. Does the end ever justify the means?

3. Clarify the terms: modem, hacker, biological warfare, Pol Pot, illegal search and seizure, data files, absolutism, moral relativism.

4. Distribute the handout entitled, "Top Secret Information." Have the class read it.

5. With one student recording notes on the chalkboard, have the class summarize the main issues of the problem.

6. Divide students into teams of three or four to plan their advice for the Superintendent of Schools, regarding his/her course of action. Prepare his/her speech to the School Board, in which he/she explains the issues and proposes a plan of action for the school system. As the Superintendent's job is "on the line," he/she must be absolutely clear and decisive enough to carry the meeting.

   a. Teams should organize themselves into the roles of leading attorney, legal consultant(s) and recorder or speech writer.

   b. Each team should present to the class its advice to the Superintendent and share its prepared speech for him. Rationale for the team's advice should be included.

7. Have the class discuss the follow-up questions found on the handout.

Top Secret Information Story*

Entry Mission High School is in turmoil this week. On Monday morning at 6:00 a.m., agents of the Federal Bureau of Investigation raided the houses of six members of the computer club. The agents had warrants that allowed them to search the family homes of the six, and confiscate all computer equipment, including any modems or other equipment used in the transmission of data over telephone lines. In three cases, they even took the telephones.

The G-men were at the school when the principal and administrative staff arrived in the morning. Again, they had warrants issued by the Federal judge. They went directly to the computer room and took all the equipment - plus both the filing cabinets in the room. All the computer classes had to be cancelled.

The FBI issued a statement that the students were hackers who had breached the computer system of the Biological Warfare Lab in Deadman's Spore, Colorado. They had used a sophisticated testing system to try different passwords until, after nearly 900,000 tries, one finally worked.

The password they hit upon was that of a senior government scientist, and they were able to gain access to a highly classified experiment. One drop of fluid under development placed in the Entry Mission Water System would be enough to kill the entire town - painfully. "These kids had the technology to become mass murderers on the scale of Pol Pot," the FBI spokesperson said. Not only were they able to find their way into the data files, but they altered the data, thereby potentially destroying millions of dollars worth of research. Scientists working on an antidote had to abandon their work to undo the damage the students had wrought in the data files.

At a Department of Justice news conference, Assistant Attorney General Rod Sterne said that the government would prosecute the high school students under the national Security Act for breach of classified data and would, moveover, sue them and their families for $600,000 each for damages suffered by the American people.

The Center for the Defense of Humankind Against Biological Weapons has proclaimed that the students are heros in the struggle against biological warfare. They have offered their lawyers to defend the students, if the students will prepare a pamphlet explaining how they penetrated the computer at Deadman's Spore. Rose Flower, Director of the Center, said, "We want to make it possible for every lover of humanity to defend our species against these barbarous weapons. These children have taken the only practical steps American citizens have ever managed to disrupt the development of these inhuman weapons. We owe them everything we have."

The affair has given rise to serious differences at the White household. The parents have written to the President of the United States, apologizing for the actions of their son. Mr. White, now an executive at an aerospace research facility, was an officer who was thrice wounded in Vietnam. He has told his son, "I will kick you right out of this house forever if you have anything to do with that Commie center." Chip White has vowed that if the government prosecutes him, "It'll be war, and I'll do that pamphlet myself if nobody'll do it with me."

At the Merski household, other problems have arisen. Mr. Merski is an accountant who uses his computer to keep his clients' tax records. Most nights be brings home some work, and the night before the raid had been no exception. Among the records confiscated by the G-men were those of Charlie's Cash and Carry Beer Depot and Sam's Muffler and Tailpipe Hospital. Both clients and Mr. Merski have brought suit against the government for illegal search and seizure of property. Mr. Merski, moreover, is suing for $25,000 a day in damages for holding a computer that is essential to his business. The spokesperson for the FBI said of Mr. Merski, "He should not have jeopordized his computer by allowing its use in illegal espionage activities."

The PTA and the School Board are also considering suing the Government to gain return of the school's computers. They claim that the rights of students are being violated by interruption of the curriculum. The FBI spokesperson said that the school's computers had frequently been used to gain access illegally to other computers, and that they had evidence which tended to show that illegal entry was a main activity of the computer club. The Assistant Attorney General hinted that the teachers who used the room would be prosecuted not only for illegal entry, but also for violation of the copyright law for the illegal copying of software diskettes. Also under consideration are charges for corrupting the morals of young people by teaching the means to gain illegal entry - and encouraging them in the activity. "Until the administration and the School Board get that school under control, there is no question of returning any equipment," the Assistant Attorney General said. "Ultimately, this is a community crime, and everyone will suffer the consequences," he said when pressed on the question of innocent students being denied instruction.

QUESTIONS

1. What did the computer club's members do to the data files of the Biological Warfare Lab in Deadman's Spore?

2. How did the government react?

3. What would the Center for the Defense of Humankind do with the pamphlet?

4. What might be the effect on America's sytem of keeping information confidential if such a pamphlet were published?

5. Are there some military issues - like chemical warfare - which require absolute ethical reactions? Explain fully.

6. Is it ever permissible to combat unethical institutions by illegal means? What is the difference between the terms ethical and legal? Evaluate the term, "relative guilt."

SAMPLE ACTIVITY #4
Self-Assessment

Subject:

Social Studies - Self Concept

Computer Literacy Student Expectation(s):

1.1.1. Recognizes computer instructions
1.1.2. Reads instructions, keyboards, output
1.5.2. Uses positive affect words
3.2.1. Identifies applications
3.3.6. Identifies applications of computer science

Instructional Mode:

Tool/Tutor

Prerequisite(s):

Students should have had previous experience with loading/booting programs.

Classroom Management:

Students should initially work alone.

Material(s):

Microcomputers with one disk drive each and printer.
Software - Mind Prober by Human Edge Software.

Handouts: (Samples are provided.)

- Self-Assessment Worksheet; (Handout #1);
- List of Behavioral Adjectives; (Handout #2);
- Definitions of Behavioral Adjectives; (Handout #3).

Readings on personality and assessment from text:

- Invitation to Psychology by Ragland and Saxon - Unit 2;
- The Cycle of Life (chapters 5-7);
- Self and Personality (chapter 11);
- The Mind Test by Aero, et al;
- Mind Prober handbook, James H. Johnson, Ph.D., et al.

Time for Activity:

A one to two-week period, depending on the number of computers and software packages available.

Teacher Preparation:

Spend an hour or so experimenting with the program. Prepare the handouts for student use.

Sequence of Activities:

1. Explain to students that they will do a computer self-assessment based on whether or not they agree or disagree with 65 adjectives which describe their behavior.

2. Given a worksheet in advance and a list of the words and definitions, have students go through the checklist and make their selections. See the sample handouts provided.

3. Have students enter their choices on the computer when the computer is available. After the assessment is completed, students should select "Make a Report" from the main menu and send the report to the printer, according to instructions on the monitor.

4. Have students file their reports which they should keep confidential. Students who do not feel threatened by the results of their reports have the option to ask a friend to run the same program, using the same list of adjectives.

5. As a follow-up, assign students to write a paper commenting on areas of the report that they feel accurately describe their personalities or do not give a true picture of themselves. Students might be asked to respond to questions, such as:

   a. What adolescent personality type do you see in your report? (See page 168 in Invitation to Psychology.)

   b. To what extent do you think the remarks in the report reflect the influence of your family? Your pets? Others?

   c. Do you think other people see you the same way? Why? Why not?

   d. According to the report, where do you fit into Lawrence Konlberg's "Stages of Moral Development"? (See pages 161-163 in Invitation to Psychology)

   e. What areas in the report do you think you need to improve upon?

6. As a follow-up, students can be assigned to make a Me-Puzzle, a real jigsaw puzzle featuring drawings and magazine cut-outs that reveal different aspects of their personalities as they see themselves. (This is one way to provide opportunities for students to use art in their work.)

SELF-ASSESSMENT
WORKSHEET

Handout #1
Self-Assessment

NAME_____

PERIOD_____

DATE_____

1. Go through the following list of adjectives - descriptive words - and mark whether you AGREE or DISAGREE with each term, if it were used to describe you.

2. After making your responses on paper, load Mind Prober into a computer (Apple IIe). Select "Assessing A New Subject" or "New Assessment" from the main options menu. Run through the word list, transferring your choices from the list in Handout #2 to the screen.

   Follow all instructions from the screen. If a printer is attached to the computer, make a hard copy of the assessment. If there is no printer, select "screen" to display your results. Your assessment can be saved to a data disk and printed later on.

3. File your assessment report in your folder. Select one of the major assessment categories from the print out, and write a short paper discussing what the computer has said about you. You may agree or disagree with the assessment. Be sure to give examples from your life to support the assessment or examples to disprove it, if you disagree with the results. REMEMBER, however, the computer only responds to what you input.

4. To help you with the assessment, a word list containing the adjectives is found in Handout #3. Refer to it if you are not sure of a definition.

WORD LIST OF BEHAVIORAL ADJECTIVES

Handout #2
Self-Assessment

BEHAVIORAL ADJECTIVES

SCREEN #1	AGREE	DISAGREE	SCREEN #4	AGREE	DISAGREE
Talkative			Self-blaming		
Egotistic			Precise		
Emphathetic			Guarded		
Apprehensive			Carefree		
Unconventional			Dependent		
Kind			Comforting		
Rigid			Affiliative		
Impatient			Ambitious		
Sympathetic			Status-conscious		
Reserved			Humble		
SCREEN #2			SCREEN #5		
Adventuresome			Accurate		
Uncaring			Defensive		
Quiet			Joking		
Sarcastic			Defenseless		
Concerned			Consoling		
Distant			Hospitable		
Competitive			Goal-oriented		
Apologetic			Seeks attention		
Outgoing			Obedient		
Independent			Responsible		
SCREEN #3			SCREEN #6		
Sensitive			Wary		
Meek			Playful		
Meticulous			Trusting		
Suspicious			Protective		
Fun-loving			Loyal		
Help-seeking			Striving		
Charitable			Seeks recognition		
Neighborly			Yielding		
Achieving			Tidy		
Approval-seeking			Secretive		
			SCREEN #7		
			Pleasure Seeking		
			Insecure		
			individualistic		
			accomplishing		
			Socially striving		

BEHAVIORAL ADJECTIVES

Adjective	Definition
accomplishing	successful, to bring to completion
accurate	correct, clear-cut, beyond doubt
achieving	accomplishing, persevering, striving
active	energetic, lively, dynamic
adaptive	able to adjust, fits in, flexible
adventuresome	daring, willing to take chances
affiliative	associated, connected
ambitious	enterprising, striving, eager
apologetic	sorry, regretful, makes excuses
apprehensive	fearful, worried, afraid
approval-seeking	wanting acceptance and praise
carefree	free of worry or responsibilities
charitable	generous, kind, giving
comforting	soothing, relieved, consoling
competitive	seeking to win, ambitious, achieving
concerned	aware, caring, interested
conservative	moderate, prudent, cautious
consoling	solace, to cheer up
cultured	refinement, gentility, taste
deep	profound, intense, wise
defenseless	unguarded, unprotected, needing shelter
defensive	protective, shielded, careful
dependent	needing aid or assistance
distant	remote, inaccessible, removed

Adjective	Definition
educated	knowledgeable, informed, cultured
egotistic	self-centered, individualistic
empathetic	aware of another, compassionate
envious	resentment, discontent, jealous
fun-loving	playful, carefree, spontaneous
goal-oriented	seeking success and achievement
good natured	amicable, pleasant, happy
guarded	kept safe, protected, watched over
hard working	eager, responsible, go-getter
help-seeking	looking for assistance or comfort
hospitable	welcoming, warm, receptive
humble	reserved, self-conscious, modest
idealistic	daydreamer, imaginative, visionary
impatient	excitable, unable to wait
independent	self-reliant, autonomous
individualistic	one-of-a-kind, independent
innovative	creative, new, original
insecure	inadequate, unsure, shaky
intellectual	rational, smart, quick-witted
jealous	envious, vigilant, fearful
joking	witty, wisecracking, jesting
kind	gentle, considerate, warmhearted
liberal	tolerant, generous, unrestrained
likeable	pleasant, enjoyable, attractive
loving	affectionate, devoted, caring

Adjective	Definition
loyal	steadfast, faithful, devoted
meek	humble, submissive
meticulous	extremely careful, scrupulous
neighborly	friendly, amicable, familiar
nurturing	nourishing, supporting, fostering
obedient	complaint, amenable, dutiful
open minded	aware, unbiased, receptive
optimistic	hopeful, positive, enthusiastic
outgoing	sociable, friendly
passive	submissive, compliant, inactive
pessimistic	gloomy, negative, depressed
playful	impish, mischievous, frivolous
pleasure-seeking	seeking gratification or delight
precise	clearly defined, exact
protective	defended, guarded, careful
quick thinking	bright, perceptive, alert
quiet	still, silent, not talkative
religious	pious, scrupulous, devout
reserved	restrained, self-controlled, shy
responsible	accountable, trustworthy
rigid	stiff, unchanging, inflexible
sarcastic	joking in a biting or cynical way
secretive	covert, underhanded, concealed
seeks attention	wanting to be noticed
seeks recognition	wanting to be praised

Adjective	Definition
self-blaming	guilt, fault, finding
sensitive	perceptive, touchy, nervous
serious	grave, earnest, weighty
silly	lacking good sense, frivolous
sincere	true, honest, natural
socially striving	seeking respectability
status-conscious	attentive to position and wealth
striving	contending, exerting effort
suspicious	doubtful, distrust, uncertainty
sympathetic	comforting, understanding
talkative	chatty, always speaking
tidy	neat, orderly, clean
trusting	confident, committed
uncaring	lacking in warmth or sympathy
unconventional	unusual, not the norm, rebellious
virtuous	pure, moral, goodness
warm	friendly, sincere, cordial
wary	cautious, watchful, on guard
yielding	deferring, relenting, gives in

RESOURCES
RECOMMENDED SOFTWARE
and
ADDITIONAL TEACHING AIDS

EXPLORATORY COMPUTER LITERACY SOFTWARE LIST
Intermediate School Level

Title	Grade(s)	Hardware	Use	Cost	Publisher
Apple Presents Apple	4-12	APP	Introduction to Computer	$ ----	APP
AppleWorks	7-12	APP	Integrated Spd, WdPr, DB	$250.00	APP
AppleWriter	7-12	APP	Word Processing	$149.95	APP
Bank Street Writer, Speller	4-12	APP, IBM, C64	Word Processing	$70-$95	SCH
Chipwits	7-12	APP	Programming/Problem Solv.	$ 39.95	BRP
Classification	4-9	APP, IBM	Problem Solving	$ 36.00	MEC
Computer Discovery: A Comp. Lit. Prog.	7-12	APP, IBM, TRS	Computer Literacy	$200.00	SRA
Cut & Paste	4-12	APP, C64	Word Processing	$ 50.00	ELA
Earth & Life Science (Sci. Vol. 3)	7-12	APP	Problem Solving	$ 39.00	MEC
Enchanter	6-12	APP, IBM	Problem Solving, Game	$ 39.95	INF
Easy Graph	4-9	APP, IBM, C64	Graphing	$ 49.95	GRO
Electronic Spreadsheet	7-12	APP, IBM	Spreadsheet	$ 49.00	MEC
Experiencing Procedures	6-9	APP, IBM	Pre-Programming	$ 36.00	MEC
Flight Simulator	7-12	IBM	Simulation	$ 34.50	MCP
Friendly Filer	4-9	APP, IBM	Data Base	$ 39.95	GRO
Fun House Maze: Strats. in Prob. Solv.	4-12	APP	Problem Solving, Game	$ 59.00	SUN
Gears	7-12	APP, IBM	Problem Solving	$ 59.00	SUN
Gertrude's Puzzles	3-9	APP	Problem Solving, Game	$ 44.95	TLC
Homeword	4-12	APP	Word Processing	$ 69.95	SOL
In Search of the Most Amazing Things	4-9	APP, IBM, C64	Problem Solving, Game	$ 39.95	SSC
King's Rule: Mathematics & Discovery	6-12	APP, IBM, C64, TRS	Problem Solving	$ 59.00	SUN
Know Your Apple	2-12	APP	Keyboard Familiarity	$ 39.95	MSE
KoalaPad Touch Tablet	K-12	APP, IBM	Graphics	$149.95	KOA
Laboratory in Cognition & Perception	7-12	APP	Problem Solving/Psych	$140.00	CON
Logo Programs	K-12	IBM	Programming	$125.00	IBM
Logo Programs	K-12	APP	Programming	$80-$150	APP
Loops	6-9	APP, IBM	BASIC Programming	$ 36.00	MEC
Lotus 1-2-3, Version 1A	7-12	IBM	Integrated Spd, WdPr, DB	$ 99.00	LOT
MasterType	2-12	APP, IBM	Keyboarding	$ 39.95	K12
Magic Slate	4-12	APP	Word Processing	$ 65.00	SUN

Title	Grade(s)	Hardware	Use	Cost	Publisher
Micro Discovery	4-8	APP	Computer Literacy	$200.00	SRA
Microtype, The Wonderful World of PAWS	4-8	APP, IBM, C64	Keyboarding	$ 39.95	SWP
Microzine	4-8	APP	Disk Magazine	$149.00	SCH
Milliken Word Processor	3-12	APP	Word Processing	$ 69.95	MIL
Mind Prober	7-12	APP, IBM	Problem Solving/Psych	$ 49.95	HES
Mind Puzzles	6-9	APP	Problem Solving	$ 49.00	MEC
Modeling	4-9	APP, IBM	Problem Solving	$ 36.00	MEC
Moptown Hotel	4-12	APP	Problem Solving	$ 39.95	TLC
Multiplan	7-12	APP, IBM, C64	Spreadsheet	$95-$195	MCP
PaperClip - Professional Word Processor	7-12	APP, IBM, C64	Word Processing	$ 59.95	BIN
PC Paint Plus	4-12	IBM	Graphics	$ 99.00	MSY
PFS: FILE	7-12	APP, IBM, C64, TRS	Data Manager	$125.00	SPC
PFS: GRAPH	7-12	APP, IBM, C64, TRS	Graph Generator	$140 00	SPC
PFS: REPORT	7-12	APP, IBM, C64, TRS	Report Generator	$125.00	SPC
PFS: WRITE	7-12	APP, IBM	Word Processing	$140.00	SPC
Print Master	4-12	IBM	Graphics	$ 59.95	UME
Problem Solving Strategies	4-9	APP	Problem Solving	$ 48.00	TLC
Processing Words	6-9	APP, IBM	Word Processing	$ 36.00	MEC
Puzzles and Posters	1-12	APP, IBM, C64, TRS	Practice Tool	$ 59.00	MEC
Robot Probe	3-12	TRS	Problem Solving	$ 49.00	SUN
Rocky's Boots	3-12	APP	Logic	$ 49.95	TLC
Snooper Troops Series	4-12	APP, IBM	Game	$ 44.95	SSC
Summer Games	6-12	APP, C64	Problem Solving, Games	$ 40.00	EPY
Story Tree	4-12	APP, IBM	Language Arts	$ 59.95	SCH
Survival Math	6-12	APP, IBM, TRS	Simulation	$ 49.00	SUN
Superscripsit	4-12	TRS	Word Processing	$199.00	RAD
Teasers by Tobbs	4-12	APP, IBM	Problem Solving, Games	$ 49.00	SUN
The Factory	3-12	APP	Problem Solving	$ 49.00	SUN
The Glass Computer	6-9	APP, IBM	BASIC Programming	$ 36.00	MEC
The Incredible Laboratory	3-12	APP	Problem Solving	$ 49.00	SUN
The Newsroom	6-12	APP, IBM	Journalism	$ 49.95	SPB
The Pond	3-12	APP, IBM	Problem Solving	$ 49.00	SUN
The Print Shop	4-12	APP, C64	Graphics	$ 49.95	BRO
The Right Turn	7-12	APP, C64	Problem solving, Games	$ 59.00	SUN
WordProof	4-12	IBM	Word Processing	$ 60.00	IBM
Zork I	6-12	APP, IBM	Problem Solving Game	$ 39.95	INF

PUBLISHER CODES

CODE	PUBLISHER	ADDRESS	CITY, STATE	ZIP
APP	APPLE COMPUTER, INC.	10260 BANDLEY DR.	CUPERTINO, CA	94017
BER	BERTAMAX (EISI)	3647 STONEWAY NORTH	SEATTLE, WA	98103
BIN	BATTERIES INCLUDED	17875 SKY PARK NORTH #P	IRVINE, CA	92714
BRO	BRODERBUND SOFTWARE	17 PAUL DR.	SAN RAFAEL, CA	94903
BRP	BRAINPOWER, INC.	24009 VENTURA BLVD. 250	CALABASAS, CA	91302
CON	CONDUIT SOFTWARE	UN. IOWA/OAKDALE	IOWA CITY, IA	52242
CSI	COUNTERPOINT SOFTWARE	4005 W. 65th ST. 3218	EDINA, MN	55435
ELA	ELECTRONIC ARTS	2755 CAMPUS DR.	SAN MATIO, CA	94403
EPY	EPYX COMPUTER SOFTWARE	1043 KIEL CT.	SUNNYVILLE, CA	94089
EWS	EDU-WARE SERVICES, INC.	22035 BURBANK BLV. 223	WOODLAND HILLS, CA	91368
GRO	GROLIER ELC. PUBL.	95 MADISON AVE. # 407	NEW YORK, NY	10016
HES	HUMAN EDGE SOFTWARE	2445 FABER PL.	PALO ALTO, CA	94303
IBM	IBM CORP.	P.O. BOX 1328	BOCA RATON, FL	33432
INF	INFOCOM SOFTWARE	125 CAMBRIDGE PARK DR.	CAMBRIDGE, MA	02140
LOA	KOALA TECHNOLOGY CORP.	3100 PATRICK HENRY DR.	SANTA CLARA, CA	95052
LOT	LOTUS DEVELOPMENT CORP.	161 FIRST ST.	CAMBRIDGE, MA	02142
K12	K-12 MICROMEDIA	172 BROADWAY	WOODCLIFF LAKE, NJ	07675
MCP	MICROSOFT CONSUMER PROD.	10700 NORTHRUP WAY	BELLEVUE, WA	98004
MEC	MECC	3490 LEXINGTON AVE. N.	ST. PAUL, MN	55112
MIL	MILLIKIN PUBLISHING CO.	1100 RESEARCH BLVD.	ST. LOUIS, MO	63121
MSE	MUSE SOFTWARE	330 NO. CHARLES ST.	BALTIMORE, MD	21201
MSY	MOUSE SYSTEMS	2336H WALSH AVE.	SANTA CLARA, CA	95051
PCS	PC SOFTWARE	4155 CLEVELAND AVE.	SAN DIEGO, CA	92103
RAD	RADIO SHACK	1400 ONE TANDY CENTER	FORT WORTH, TX	76102
SCH	SCHOLASTIC, INC.	P.O. BOX 7502	JEFFERSON CITY, MO	65102
SOL	SIERRA ON-LINE, INC.	SIERRA ON-LINE BLDG.	COARSEGOLD, CA	93614
SPC	SOFTWARE PUBLISH. CORP.	1901 LANDINGS DR.	MOUNTAIN VIEW, CA	94943
SRA	SCIENCE RESEARCH ASS. INC.	155 N. WACKER DR.	CHICAGO, IL	60606
SRB	SPRINGBOARD SOFTWARE, INC.	7807 CREEKRIDGE CIRCLE	MINNEAPOLIS, MN	55345
SSC	SPINNAKER SOFTWARE	215 FIRST STREET	CAMBRIDGE, MA	02142
SUN	SUNBURST COMMUNICATIONS	39 WASHINGTON AVE.	PLEASANTVILLE, NY	10570
SWP	SOUTH WESTERN PUB. CO.	5101 MADISON RD.	CINCINNATI, OH	45227
TLC	THE LEARNING COMPANY	545 MIDDLEFIELD RD. 170	MENLO PARK, CA	94025
UME	UNISON MEDIA	2150 SHATTUCK AVE.	BERKLEY, CA	94704
XER	XEROX EDUCATION PUBL.	245 LONG HILL RD.	MIDDLETOWN, CT	06457

ADDITIONAL TEACHING AIDS

Available at the TECHNICAL ASSISTANCE CENTER
3645 Waialae Avenue, Room B-6
Honolulu, HI 96816
PH: 735-2825

COMPUTER KEYBOARDS AND CHARTS

Apple IIe Keyboard	37" x 11"
Apple IIe Keyboard	8½" x 13"
Commodore 64 Keyboard	31" x 13"
Commodore 64 Keyboard	18" x 14"
IBM-PC Keyboard	10" x 38"
IBM-PC Keyboard	8½" x 11"
Radio Shack TRS-80 Model 4 Keyboard (with key pad)	38" x 12"
TRS-80 Color Computer 1 & 2 Keyboard (without key pad)	14" x 18"
IBM Selectric Typewriter Keyboard	29½" x 11"
Special Keys: Apple IIe Chart	23½" x 14"
Special Keys: IBM-PC Chart	14" x 23½"
Computer Finger Chart	8½" x 13"
Care and Handling of Diskette Chart	18" x 12"
Computer Etiquette Chart	18" x 12"
Computer System Components and Functions Chart	18" x 12"

Note: The Apple and Commodore Keyboards are screenprinted on heavy Crescent boards. All others are printed or Xeroxed on white paper. Subject to availability.

Oahu requesters: Call if items are available for pick up.
Neighbor Island requesters: Contact your district liaison for TAC.

TEACHING KIT

The Flip Side of Floppies, A Basic Introduction to Computers and Floppy Disks Featuring Robot Tutor Viktor Verbatim by Verbatim Corporation. (Includes a ten-minute, color videotape and teaching guide)

Call TAC librarian, at 735-2825 to reserve teaching kit.