# Instructional Computing Demonstration

ATARI®
LEARNING SYSTEMS

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# Using This Program at Home

Many ATARI® Learning Systems program manuals were originally designed for use by teachers in the classroom. The programs themselves, however, are no less engaging and instructive for "independent learners"—children, students, and adults—working at home.

Every manual includes a "Getting Started" section that explains how to load the program into your computer system quickly and easily. Since many basic prompts and other instructions are displayed right on your screen, that's all you'll need to begin learning and exploring with most ATARI Learning Systems programs. But whether you're a parent, a tutor, or a home learner teaching yourself, it's a good idea to look through the teaching materials in your manual. You're likely to find important details on using the program, valuable supplementary information on its subject matter, and some creative ideas for getting the most educational and entertainment value out of your ATARI Learning Systems program.

# Introduction

The idea of using a computer in the classroom was once a concept of the future. Today, computers are in classrooms at all levels, and their continued presence seems assured. As computer awareness grows among students, parents, teachers, and administrators, so does the need to know what computers can contribute to education.

The *Instructional Computing Demonstration* module is designed to aid you in giving a series of brief demonstrations illustrating the use of the ATARI® computer in instruction. The full demonstration using the diskette takes about one hour.

Although this booklet and the diskette emphasize instructional applications, the use of the computer as a device for teaching computer programming shouldn't be ignored. An important part of instructional use of computers is to teach students to control or program the computer. You're encouraged to demonstrate computer programming by executing a brief sample program using statements such as Print, For, Next, or Let.

Handout pages in this guide may be duplicated for use with participants.

# Getting Started

Follow these steps to load the Instructional Computing Demonstration program into your ATARI computer system:

1. With your computer turned off, turn on yur television set or monitor and disk drive. Wait for the busy light on the disk drive to go out.

2. If your computer is *not* equipped with built-in ATARI BASIC, insert an ATARI BASIC cartridge in the cartridge slot (the left cartridge slot on the ATARI 800® computer).

3. Insert the Instructional Computing Demonstration diskette in your disk drive (disk drive 1, if you have more than one drive) and close the disk drive door or latch.

4. Turn on your computer. As your disk drive goes to work, you'll hear a beeping sound while the first part of the program loads into your computer. After several moments, a title screen will appear on your screen, followed by a menu of program selections.

Because your computer loads portions of the program as you use them, you must leave the Instructional Computing Demonstration diskette in your disk drive while using the program.

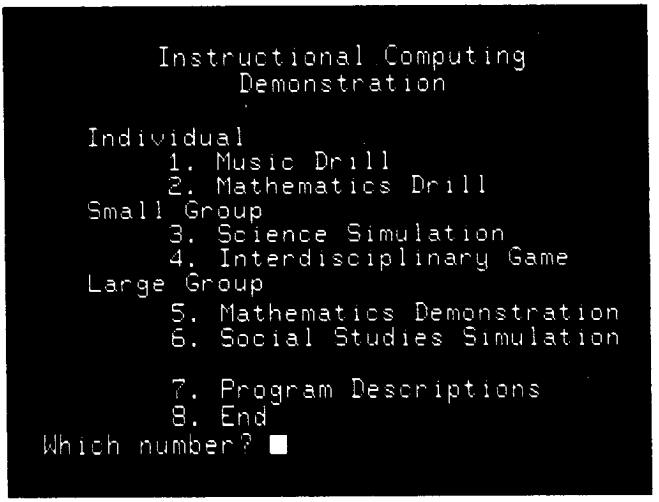
Some questions asked by the Instructional Computing Demonstration program require a simple Yes or No answer. You may respond by typing **YES** or **NO**, or simply by typing **Y** or **N**. Always press **RETURN** to confirm your response to a question. You may usually change your response before pressing **RETURN**; just use the **DELETE BACK SPACE** key to delete your original response, then type in the new response.

To return to the program menu, hold down the **ESC** key. When the question Do you want to try again? appears, type **N** and press **RETURN**.

For access to any teacher options available in the Instructional Computing Demonstration program, press **CRTL** and **A** simultaneously.

# General Description

The *Instructional Computing Demonstration* for the ATARI computer has the following menu:




## Organization of Module

The programs on the diskette are grouped in three categories. Each category illustrates a way to organize a classroom using the computer:

**Individual**—Students interact one-on-one with the computer.

**Small groups**—Students work cooperatively and interact with the computer. The students can enter their results immediately into the computer, or group decisions can be transferred to the computer after the students' work is completed.

**Large group**—An entire classroom of students uses the computer, with the teacher directing the discussion.

Although this module is divided by classroom use strategies, the programs also demonstrate different modes of instruction:

- Drill and practice
- Simulation
- Educational game
- Problem solving
- Demonstration tool

## Diskette Operation

Some of the programs on the diskette use the color and sound capabilities of the ATARI Computer. You should plan to use a color television with the volume adjusted for the audience.

To use the diskette, type the number of the program desired. As each demonstration is completed, the menu will return automatically to the screen. Any time during a demonstration when input is requested, you can press the escape key (**ESC**) to interrupt the program. The question "Do you want to try again?" will be asked. If you answer **NO**, the menu will appear again. To use another diskette, use Option 8, **END**. The demonstration will take about one hour.

## The Presentation

Before the demonstration, read this guide thoroughly and run all programs on the

diskette, using different options illustrated in the sample programs. Each classroom use strategy is discussed in detail in this guide. Two example programs are included on the diskette to illustrate each category. Point out that the example programs could be incorporated into the classroom using a different grouping than the one given here. Teachers will incorporate the computer into the classroom in creative ways to fit their school environment.

For each program described in this booklet, the following kinds of information are given:

**Educational Uses** A description of the unique features of this program that contribute to learning.

**Background Information** Content necessary for you to discuss the topic. Since this demonstration module contains programs from several different subject areas, it will provide you with a limited knowledge of the subject.

**Demonstration Techniques** Techniques for you to use in giving a presentation on instructional computing in front of a group, using a computer.

**Laboratory Techniques** Techniques to use if each participant has access to an ATARI computer. Two to four participants per machine is a workable plan.

**Source** A reference indicating the module in which the program is included.

# Individual Use Strategies

## Classroom Use Strategy

A computer can be used to tutor or drill students on a one-to-one basis. It can be located in the classroom, a computer laboratory, or a media center. In some primary classrooms, teachers have found it successful to locate the computer near their desk until students become familiar with it. Often a back corner of the classroom is an appropriate location.

The computer materials can provide review or reinforcement of concepts already presented, or they can introduce new concepts. Students who might effectively use computer materials individually include those

- needing remedial instruction
- absent during classroom presentations
- needing additional challenge, a more in-depth study of a topic, or exposure to related topics
- working in a learning center
- doing independent study

# Individual Use Strategies

The teacher should not use the computer merely to keep a student busy. The computer instruction should be an integral part of the curriculum. Activities on the computer should relate to concepts being studied in the classroom.

Computer courseware that allows the teacher to modify the sequence or the content (such as Words) is especially valuable. The teacher's ability to select and modify parts of a computer module is important in integrating computer courseware into the curriculum and in designing programs to meet individual needs of the students.

Two examples of programs that can be used individually with students are Rhythm, a music drill, and Base Ten, a mathematics drill.

# Individual Use Strategies

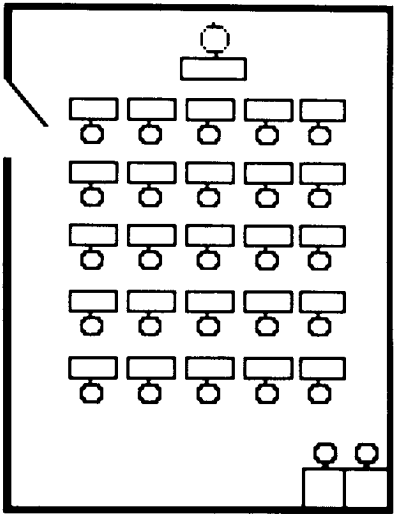
## Overview

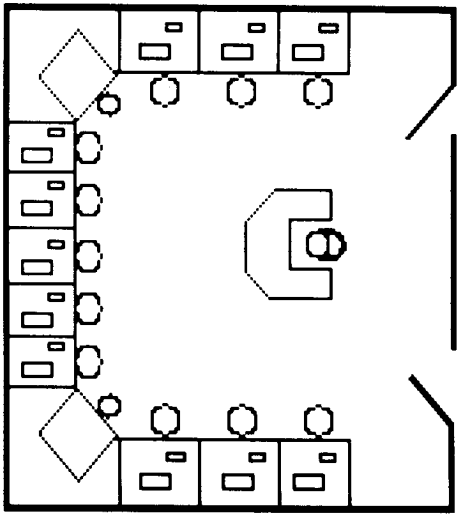
**Preferred Modes of Instruction:**

Drill
Tutorial
Problem Solving

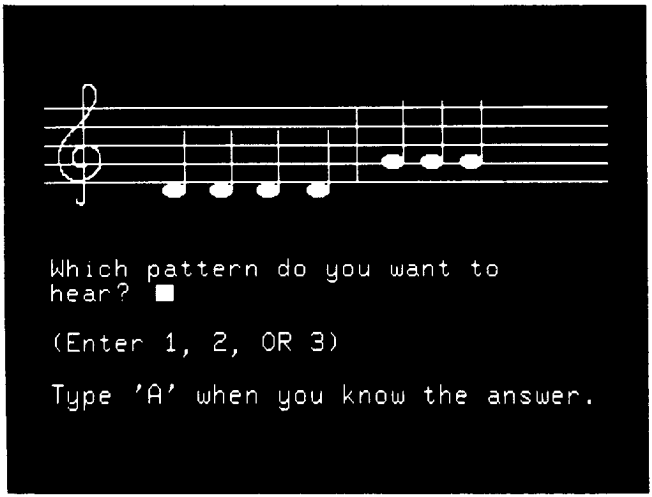
**Main Benefit:**

Student Controls Content and Pace of Learning





## Music Drill—Rhythm




### Educational Uses

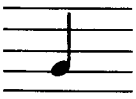
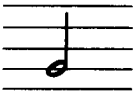
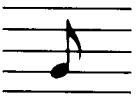
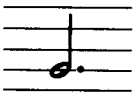
Music theory is a skill-oriented discipline that requires practice. Just as baseball players must practice batting and fielding, music theory students must practice reading music and listening to music. Traditionally, this practice isn't a solitary activity. A teacher must evaluate the student's efforts and, in the case of ear training, a teacher must also present the music to be heard. This is a tedious and time-consuming task for the teacher. But the ATARI computer can present both visual and aural stimuli and provide instant feedback to student responses. In addition, it can produce hundreds of problems of a given type through use of random selection. Thus the computer can relieve the teacher of drill work while providing the student with individualized activities.

## Background Information

In the Rhythm program, a pattern will be displayed graphically on the screen. The computer will play three different rhythm patterns. The participants must choose the pattern that matches the one on the screen.

To demonstrate the Rhythm program, a certain degree of musical knowledge is necessary to discern correct patterns. Most audiences will have at least one or two participants with a musical background. Encourage audience participation.

When evaluating rhythm, you may want to refer to the following:

| | | |
|---|---|---|
| Quarter note |  | one beat |
| Half note |  | two beats |
| Eighth note |  | half a beat |
| Dotted quarter |  | one and a half beats |
| Dotted half |  | three beats |

# Individual Use Strategies

## Demonstration Techniques

Select menu option 1A, Music Drill. For most audiences, simple problems (program choice #1) should be selected. Show participants the Chart of Stored Patterns as a representation of different problem levels. Select three or four example problems, and encourage audience participation in determining the correct answer. Answer a few problems correctly, but also answer at least one problem incorrectly.

## Laboratory Techniques

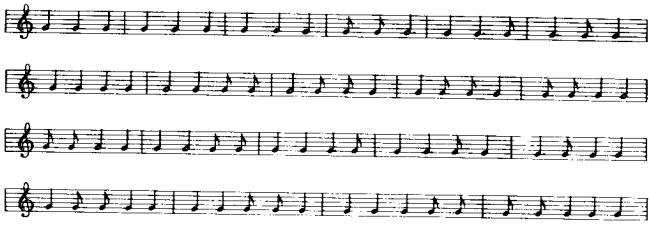
The Rhythm Recording Sheet on page 16 can be used if ATARI computers are available for the participants. Fill in the number of problems to be worked and the mastery level before the sheets are duplicated—a suggested number of problems is four, and the level of mastery is two. Have participants record their scores as students would in trying to achieve mastery.

## Source

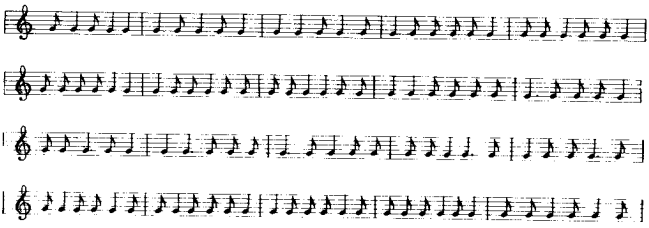
This program is included in the ATARI Learning Systems *Music II—Rhythm & Pitch* program.

## Rhythm Chart of Stored Patterns

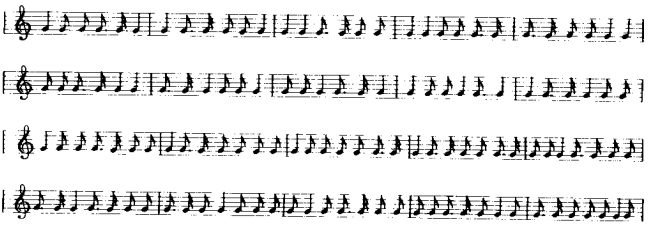
### Level 1 Patterns



### Level 2 Patterns



### Level 3 Patterns



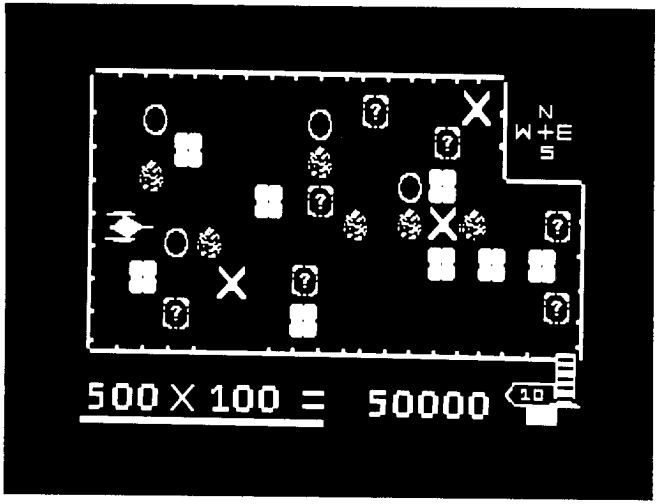
## Rhythm Recording Sheet

Number of Problems to do _____

Number correct needed for mastery _____

| Level (1, 2, or 3) | Number Tried | Number Correct | Mastered (Yes or No) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## Math Drill—Base Ten




### Educational Uses

Base Ten demonstrates the use of graphics and a game-like format to reinforce multiplication skills. The ability to randomly generate numbers and the obstacles in the galaxy makes the drill different each time the students use the program. The computer's ability to store information is demonstrated by the motivational score sheet displayed at the end of the program.

### Background Information

The objective of this drill is to improve accuracy and speed in mental multiplication of numbers that are multiples of ten. The program also reinforces the student's knowledge of the four directions (north, south, east, and west) used to direct the spaceship

to its base. After the participant answers the problem correctly, a spaceship moves from the lower left corner of the screen toward Base Ten. There is always a clear path around the outside. Obstacles such as black holes, Xs (danger), vapor clouds, or asteroids appear in the galaxy. Each obstacle produces a different result based on an arbitrarily assigned probability.

In a black hole, there is a 90 percent chance the ship will be transported to another point on the screen and a 10 percent chance the ship will be destroyed. The big X will always destroy the ship.

The movement of the ship is determined by the speed at which students answer the problems. If students don't answer in time or if they get the problem wrong, they have a second chance. If correct the second time, they remain in the same place. If wrong, they move backward, and two turns are added to their score.

If the ESCape key is pressed during operation of this demonstration, the score sheet will appear instead of the question "Do you want to try again?" This happens *only* on this demonstration diskette.

A teacher option allows the teacher to delete the names listed on the score sheet. It can be accessed at the menu. Instead of choosing options 1–8, type Control A. Instructions will appear, describing how to delete the names.

## Demonstration Techniques

When demonstrating the program, choose a path that encounters obstacles.

Show the score sheet feature either by reaching Base Ten or pressing the ESCape key. Explain to the participants that the ESCape works this way only on this demonstration diskette.

Return to the menu and demonstrate the teacher option to delete the names. Discuss with participants how they might use this option.

## Laboratory Techniques

Have each group of participants play the game several times, taking turns at the keyboard. After groups have finished, explain the Control A option and have them delete the names from the score sheet.

## Source

An unaltered version of this program can be found in the ATARI Learning Systems *Basic Arithmetic* program.

# Small Group Use Strategies

## Classroom Use Strategies

A computer can be used effectively with groups of two to six students. In working as a group with the computer, students are encouraged to devise group strategies and participate in discussions. In other cases a group might try competitive strategies against other groups. Teachers can group students by skill level, or they can create groups with different skill levels to encourage peer learning.

Simulations and educational games usually make good small group activities. Student groups can alternate between using the computer and working with worksheets or other materials that help develop the same concept. For example, before using a simulation like Earthquakes, the teacher has presented the concept of how to locate an earthquake. One group could be completing a worksheet, a second group could be researching the San Francisco earthquake, and another group could be working at the computer.

The computer or computers might be located in the back of the room. Some simulations don't require that the computer be in the classroom. For example, in simulations requiring decisions for operating a company, the students can make quarterly decisions in the classroom on a worksheet form that could be processed by the computer for the next class period.

Two examples of programs that can be used effectively with small groups are included in this demonstration: Earthquakes (science simulation) and Words (interdisciplinary game).

# Small Group Use Strategies

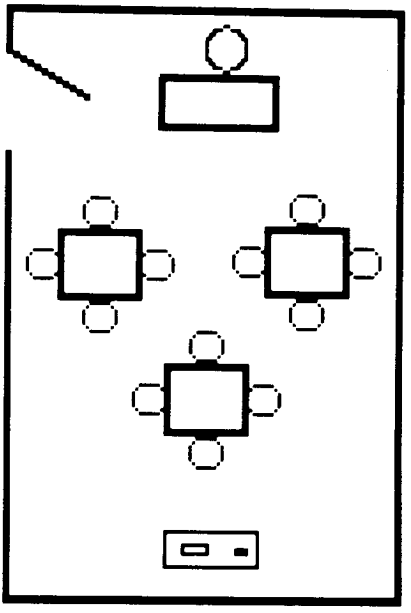
## Overview

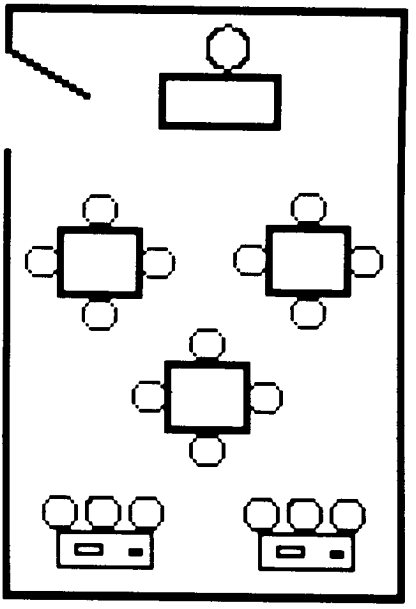
**Preferred Modes of Instruction:**

Simulation
Educational Game

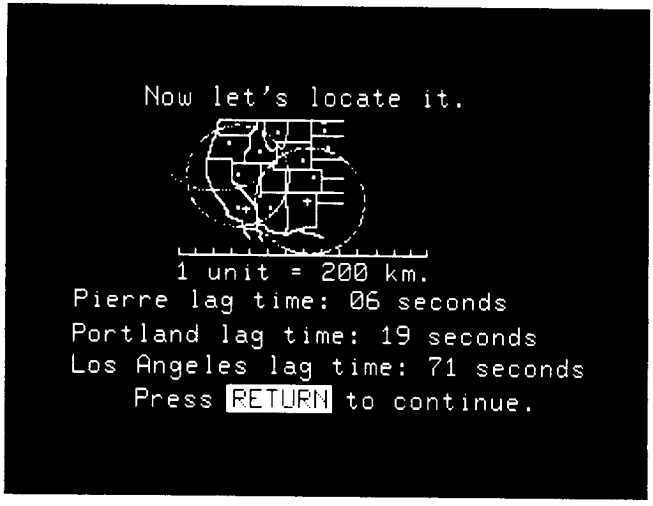
**Main Benefit:**

Student Cooperation is Encouraged





## Science Simulation—Earthquakes




### Educational Uses

Many techniques can be used to introduce the concept of earthquakes to a middle school science classroom — for example, reading a textbook, seeing a film, having a seismologist talk to the group. The method used in this computer application is one of simulated real-life experience. The program randomly locates sites where a simulated earthquake occurs somewhere within the western United States. As with most computer simulations, it is beneficial to the students to provide related noncomputer activites both as preparation and as follow-up. The *Earth Science* teacher's guide provides suggestions for integrating the program with the general curriculum.

# Small Group Use Strategies

## Background Information

The version of Earthquakes on this *Instructional Computing Demonstration* module is only one section of the total program. In the complete version, the concepts are introduced as a tutorial before the student attempts to locate the epicenter of the simulated earthquake. Before the simulation, it is assumed the student already knows the meanings of:

- Primary waves (similar to sound waves)—result from the back-and-forth movement of the rock. This is the first wave recorded by the seismograph.
- Secondary waves (similar to water waves)—which result from the up-and-down movement of the rock. These waves move more slowly and arrive some time after the primary wave.
- Lag time—the time interval between the arrival of the primary wave and the arrival of the secondary wave.
- Epicenter—the place on the surface of the earth directly above the location where the quake occurred.
- Formula used to calculate kilometers to a quake's epicenter—the differences in the times of arrival of the two waves would account for about 100 kilometers for every eight seconds. Thus, the lag time divided by 8, times 100 would be the number of kilometers from the quake's epicenter.

Since three stations are necessary to locate the epicenter of a quake, readings from three stations will be reported. A map of the western United States appears. Based on the data provided, the objective is to locate the epicenter of the quake. Use the arrow keys or the joystick to position the square cursor on the epicenter. When the quake is located, press the **RETURN** key and the computer will do the calculations by drawing three concentric circles and showing the actual location of the quake.

## Demonstration Techniques

Explain to the participants the background information necessary to find the epicenter of a quake. Position the square at the location agreed upon by the participants.

## Laboratory Techniques

If used in a laboratory situation, provide the participants with copies of the worksheet and a drafting compass. Give them an overview of the necessary terms and the methods needed to locate a quake. Have them locate the quake on their worksheet, using a compass. They should then check their results by indicating this location on the computer map.

## Source

The complete version of this program can be found on the ATARI Learning Systems *Earth Science* program.

**Earthquakes**

Use a compass to determine the epicenter requested by the computer.

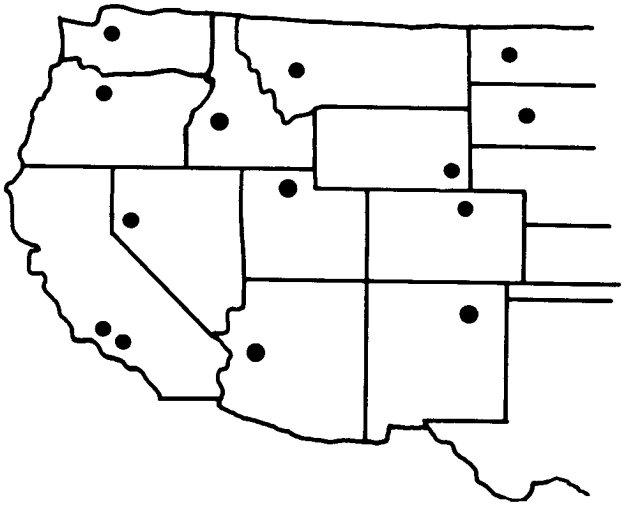
Station: _____

Lag time: _____

Station: _____

Lag time: _____

Number of
kilometers off: _____



**Earthquakes**

Use a compass to determine the epicenter requested by the computer.

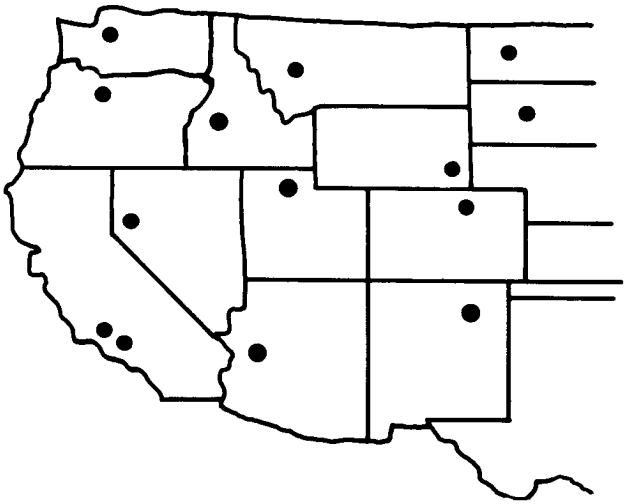
Station: _____

Lag time: _____

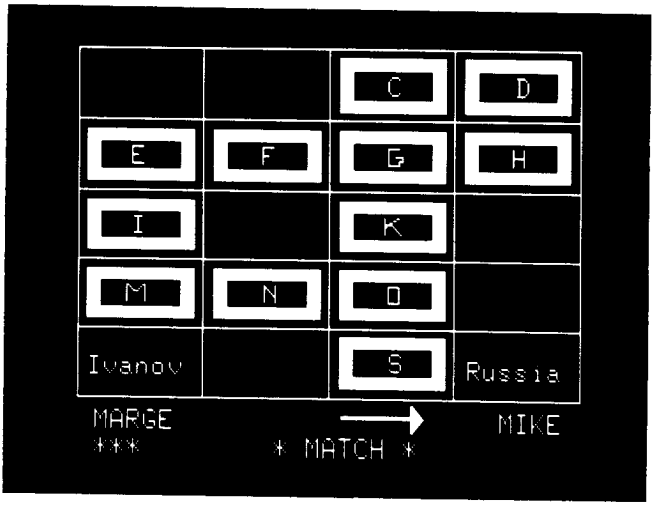
Station: _____

Lag time: _____

Number of
kilometers off: _____



## Interdisciplinary Game—Words




### Educational Uses

The computer has a list of names matched to the country of their origin. However, other words can be substituted. Point out this aspect of teacher control to participants, emphasizing that students can be introduced to chemistry terms, foreign language, spelling words, or computer terms in a game format.

### Background Information

Words can be used to match the same word or to match a word with a related word in a concentration-type format. The game may be played by two opponents or by one person competing against him or herself. If one person plays, a summary score reports the number of tries it took to match all words.

The word list may be changed. When the menu appears, type **CONTROL A** (press **CTRL** while typing **A**), and choose the option to change the word list in Words. Follow the instructions provided.

## Demonstration Techniques

Discuss or demonstrate how the word list can be personalized by using the teacher option. Let two participants take student roles in playing the game, or divide the group into two teams.

## Laboratory Techniques

Change the words in the program to reflect the special interests of a particular group, or have participants suggest pairs of words to type in on the teacher option.

## Source

This program can be found in the ATARI Learning Systems *Pre-Reading* program.

# Large Group Use Strategies

## Classroom Use Strategies

The television or monitor should be set up so all students in a classroom can view the screen. The teacher can use the computer to:

- provide motivation when introducing a new topic
- present concepts
- review concepts in a highly motivational way
- do a demonstration
- provide a simulation activity

Using a single computer with 30 students at one time makes the computer a very cost-effective device. Teachers are encouraged to look for ways to use the computer with large groups of students.

Two examples of programs that can be used with large groups are included in the demonstrations Slope (a mathematics demonstration) and Lemonade (a social studies simulation).

# Large Group Use Strategies

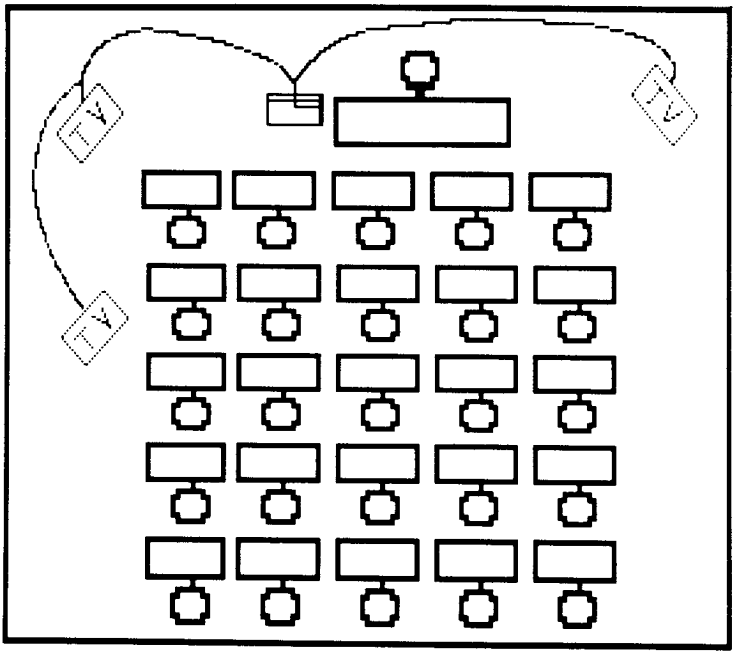
## Overview

### Preferred Modes of Instruction

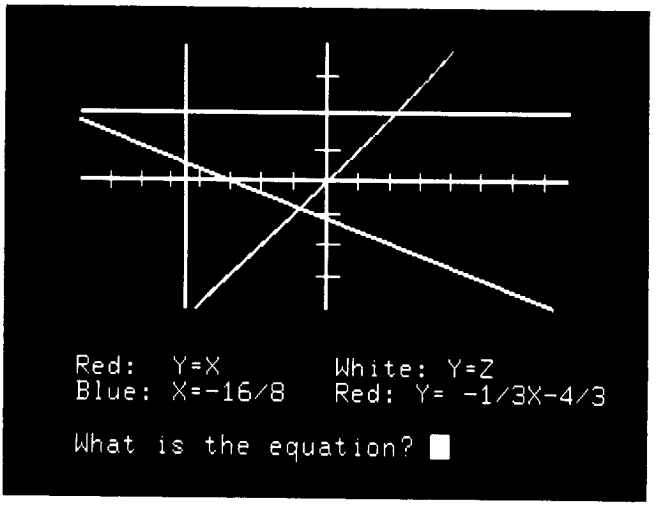
Problem Solving
Demonstration Tool

### Main Benefit:

Teacher Presentations are Enhanced



## Mathematics Demonstration —Slope




### Educational Uses

Slope is a flexible tool that allows the user to enter any equation that represents a straight line and see it graphed on a coordinate grid. The teacher can use this program to demonstrate the relationship between a linear equation and its graph. Using this program, a teacher can build a unit of study in Algebra I or Algebra II. Following the study of slope and intercept, topics such as parallel and perpendicular lines, triangles, quadrilaterals, distance, and simultaneous equations can be introduced.

## Background Information

The equation for a straight line is in the form $y = mx + b$ where m and b are numbers. For example:

$y = 2x + 3$
$y = \frac{1}{2}x - 4$
$y = 1x + 4$
$y = -\frac{1}{3} + \frac{2}{3}$
$y = 0x + 2$ or $v = 2$

Also, the equation $x = b$, where b is a number, represents a vertical line. For example:

$x = 3$
$x = -\frac{1}{2}$

The program can be used in mathematics to introduce the concept of the slope or slant of a line and the y intercept, the point where the graph crosses the vertical axis.

## Demonstration Techniques

You could use the following sets of equations in the presentation:

$y = 2x + 2$
$y = 2x + 4$
$y = 2x$
$y = 2x - 2$

Study the difference in the equations. Observe the differences in the graphs. Try to guess what the graph of the fourth equation will look like before it's graphed.

## Large Group Use Strategies

See if the participants can draw some conclusions about the effect that changing the number (the constant) in the equation will have on the graph. Discuss how the program might be used in an instructional setting.

## Laboratory Techniques

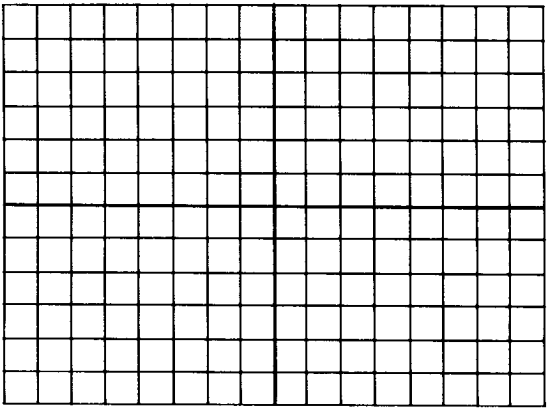
Use the SLOPE Worksheet and have participants learn about the slope of a line.

## Source

This program is found in the ATARI Learning Systems *Graphing* program.

## Slope

Use the Slope program to graph the equations below. Record and label the graphs on the grid.



$y = 1x + 2$

$y = 2x + 2$

$y = 3x + 2$

$y = \frac{1}{2}x + 2$

$y = \frac{1}{4}x + 2$

General form of the equation: $y = mx + b$

Looking at these graphs, what seems to happen as the number multiplied by x gets larger? _____

_____

_____

What seems to happen as the number multiplied by x gets smaller? _____

_____

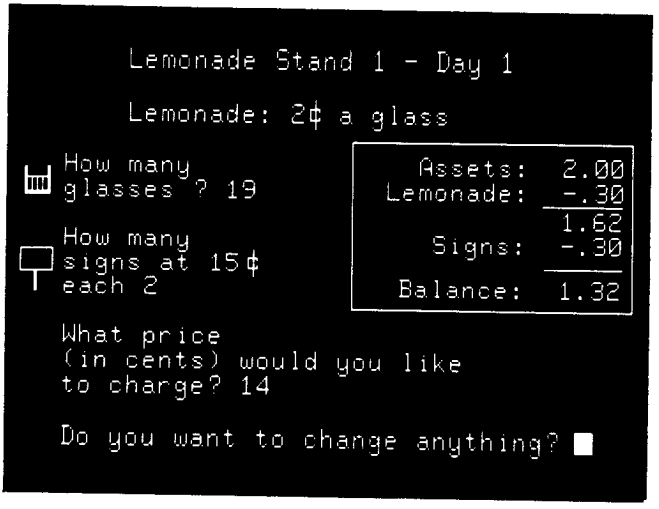
_____

What effect does the number multiplied by x have on the graph of the equation? _____

_____

Try some more equations to verify your answers.

## Social Studies Simulation—Lemonade




### Educational Uses

The computer is used to simulate the experience of selling lemonade. The computer's ability to generate random events produces a different "best selling price" and series of events each time the students use the program. Graphics and sound make the learning experience fun and motivating.

This program also demonstrates the computer's ability to quickly calculate and report results of students' decisions.

### Background Information

Students using the Lemonade simulation make decisions that are similar to those they make in running a real lemonade stand. Each day the students decide how much lemonade to

make (production level), how many advertising signs to make, and how much to charge for each glass of lemonade. The computer analyzes their input and correlates it with random events, such as a heat wave, and gives the students a daily profit/loss chart. Economics and math skills are developed.

The program on this *Instructional Computing Demonstration* module has been changed to introduce more random events than occur in the regular version of Lemonade.

## Demonstration Techniques

Divide the group into two teams. Demonstrate Lemonade for three or four rounds. Each group makes decisions for running their lemonade stand and observes the results of those decisions.

## Laboratory Techniques

Have the groups run the program and use the Lemonade worksheet to record their results. The different groups can then compare the data entered and the results.

## Source

An unaltered version of this program can be found on the ATARI Learning Systems *The Market Place* program.

## Lemonade

| | Day__ | Day__ | Day__ | Day__ | Day__ | Day__ |
|---|---|---|---|---|---|---|
| Glasses made | | | | | | |
| Signs made | | | | | | |
| Price | | | | | | |
| Glasses sold | | | | | | |
| Income | | | | | | |
| Expenses | | | | | | |
| Profit | | | | | | |
| Assets | | | | | | |

The ATARI Learning Systems Instructional Computing Demonstration program was developed by the Minnesota Educational Computing Consortium (MECC). The Rhythm program, one of a series of eighteen programs on music theory, was developed by Linda Borry, MECC. Cynthia Schroeder and Todd Bailey transferred the code to the ATARI computer. The idea for the Base Ten game was developed for the ATARI computer by Marge Kosel and Mike Fish. The programming was done by Mike Fish, MECC. The Quakes program was created for the MECC Timeshare System by Curt Hoppe and John Lillifors, East Grand Forks School District, Minnesota, under a MECC Mini-Grant. The program was transferred to the ATARI computer by Bret Indrelee. Words was created by Marge Kosel and Mike Fish and rewritten for the ATARI computer by Mike Fish to include matching words. Slope was designed and programmed by Marge Kosel. Darrell Ricke wrote the ATARI computer version. Lemonade was created by Bob Jamison, MECC. The ATARI computer version was programmed by Mike Boucher and Mike Fish, MECC.

Every effort has been made to ensure the accuracy of the product documentation in this manual. However, because we are constantly improving and updating our computer software and hardware, Atari, Inc. is unable to guarantee the accuracy of printed material after the date of publication and disclaims liability for changes, errors or omissions.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