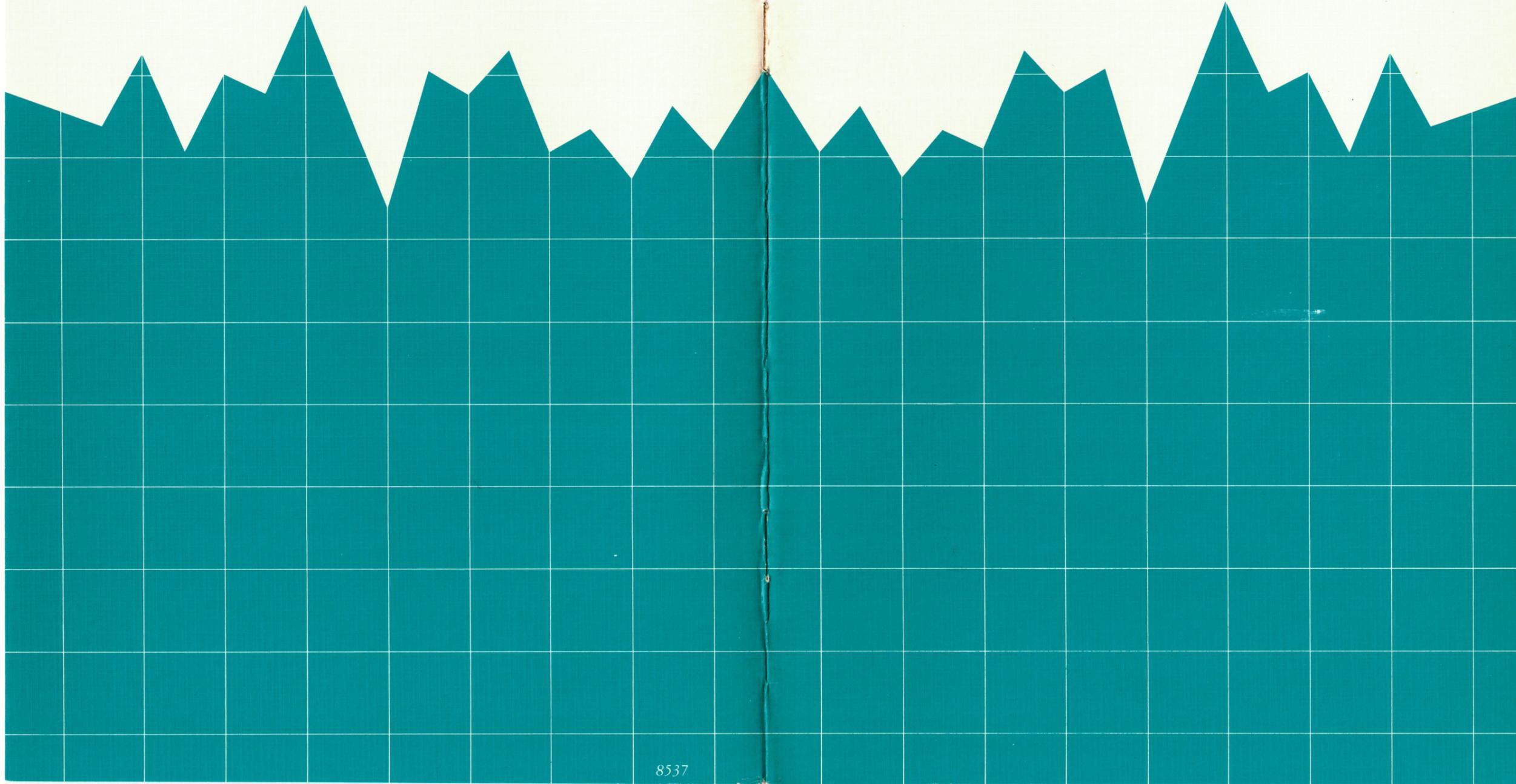


# Exploring Tables and Graphs

*User's Guide*



periments to make another set of graphs to compare boats and floatability!

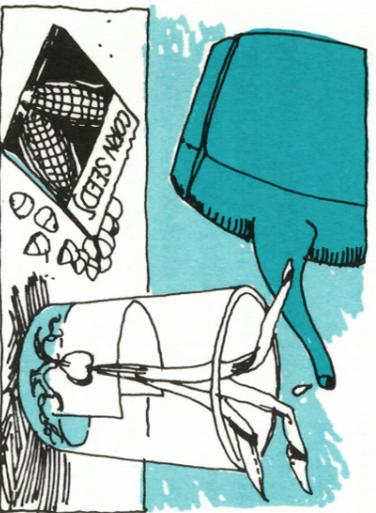
By the way, be sure to share your findings with your science class. If you don't have a printer, remember that you can make your own picture graph on paper! The science teacher may really be impressed with your sink-and-float investigations!

### Grow and Show

Here's another simple science experiment for you to do. You need two bean or corn seeds, two glasses, paper toweling, water, and light.

Place each seed in a glass, as shown, so that you can easily check on root and stem growth. Make sure the paper toweling is wet. Then pour a little water into each glass. The paper toweling will drink up the water to keep the seed moist.

Now put one plant in a sunny



area and the other plant in a not-so-sunny area. Keep a chart about the growth of Seed A (in the light) and Seed B (not in the light). Be sure to keep the paper toweling moist during the experiment.

Measure the root and stem growth of the seeds each day. Put the data on your chart. After a month, transfer your data from paper to the "Create a Table" section of your *Exploring Tables and Graphs* disk. Then ask the computer to make a bar graph showing the difference in growth rates for the two seeds. What do you think made the difference?

### Lollipop Lickin'!

How about running a survey to find out how long it takes to lick a standard-sized lollipop? All you need are some lollipops (make sure they're all the same size), a few friends who'll volunteer to do the licking, a watch that tells the seconds, and paper and pencil.



You can watch one lollipop licker at a time or run a contest and let all the kids lick their lollipops at one time. Be sure to re-

mind the volunteers that no crunching is allowed!

Write down the exact number of minutes and seconds it takes each person to finish his or her lollipop. Then use that data to create a table, and use the table to create graphs on the computer!

You may want to survey lollipop crunchers too. This time, let the volunteers lick and crunch their lollipops to see who finishes fastest. Use the new data to create a new table and new graphs!

### Heaps of Homework?

Do you think you have too much homework to do? Do you really know how much you have... and how long it takes you to do it? Well, use your handy-dandy table and graphs skills to help you find the facts and show what you know!

Use one of the Take-Along Tables on pages 27-30 to help you keep track of the amount of time you spend on homework each day for one week. Be sure you put down only the minutes you spend actually doing homework—don't include the breaks you take while you work!

Enter the data from your table into your computer. Then let the computer show you graphs about your homework load for one week.



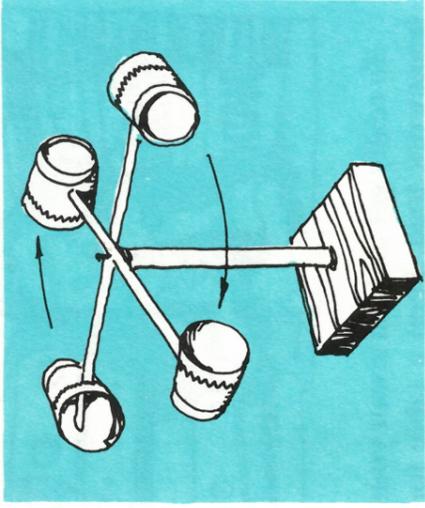
To really get an idea about your homework load, keep a table for every week during a month. Then feed all the four-week data into the computer and compare one week's work load to another's.

If you have a printer, make copies of your work to show your family. If you don't have a printer, make an on-paper picture or bar graph to prove to one and all that when you say, "Wow! Have I got a lot of homework to do!" you mean it!

### Watch the Wind!

Make an anemometer to check the speed of the wind. Keep a chart of wind speeds for a week, two weeks, or a month. Then use the statistics to create a table... and let the computer graph your data for you.

To make the anemometer, you need two sticks, four paper cups, some scraps of wood, and some nails. Put the instrument together to look like the one shown here.



Once you've made the anemometer, use a brightly colored marker to make a large dot on one of the paper cups. Then, take the anemometer outdoors. Put it in an open area where the paper cups will really catch the wind. The harder the wind blows, the faster the paper cups will turn.

To find the speed of the wind, count the number of turns that one cup makes in 30 seconds. (To make this easier on a windy day, keep your eye on the cup you've made a mark on.) Now divide the number of turns by five to get a rough idea of the speed of the wind!

To see how accurate your wind-speed indicator is, check local newspapers or TV weather re-

ports. Keep a list of the wind speeds that the local meteorologist gives each day. Now make a table comparing your wind-speed figures with those of the official weather report. Have the computer make a bar graph to see how close your do-it-at-home data came to the superscientific forecasters!

### Let's Get Physical!

Are you physically fit? How do you stack up against other kids your age across the U.S.? Find out and make graphs to show your data.

Below, you'll find the standards for several events set by the AAU (Amateur Athletic Union) for kids ages 8-12. Feed this data into the computer and create a table titled "Physical Fitness." Use the AAU's statistics in column 1 of the table. Later, you'll put data about your own events in column 2.



#### Event 1. Bent-Knee Sit-Ups

(one-minute time limit)

Girls Age 8 9 10 11 12

27 30 31 32 33

Boys Age 8 9 10 11 12

29 32 33 36 38

### Flying Ptero-GRAPH-dyl!

Have some flying fun with a friendly pterodactyl as you gather data for a table! You'll need the pterodactyl cutout on page 23 of this book, a yardstick or measuring tape, some paper, and a pencil.

First, carefully cut out the pterodactyl and fold as shown. Then fly the bird as you would a paper airplane. If you have difficulty getting your dino to soar, add a paper clip to the beak for better balance!



When your pterodactyl comes down to earth, measure its flight path from takeoff to landing and write down the statistics. For example: **Flight #1, 87 inches.**

Now fly your pterodactyl several more times and record the data. When you have statistics for five or more flights, turn the information into a table on the "Make Your Own" disk. Then ask the computer to show you graphs about your ptero-GRAPH-dyl's flights!

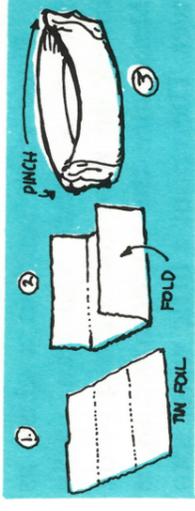
For more figuring fun, have a contest with friends to see who can fly the ptero-GRAPH-dyl the farthest!

### Sink the Ship!

Try this very simple science experiment. Record your scientific findings. Then let your friendly computer show you some graphs about what you've discovered!

To run the experiment, you need aluminum foil, water, coins or nails.

Make a boat by folding the aluminum foil as shown. Float your boat in a tub or bowl filled with water. Then, one by one, add coins or nails to the boat until it begins to sink. Keep adding more weight until the floatable can no longer float!



Write down the number of coins or nails you put into the boat. Then make another boat and run the experiment again. Can your new boat hold more coins or nails before it sinks?

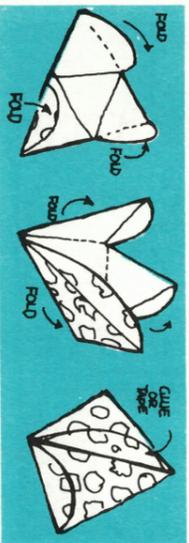
After you've gathered evidence from a few sink 'em experiments, feed your data into the computer to make a table and some graphs.

Now try using paper or cardboard to make more boats to see if some are better sailers than others. Use the data from these ex-

you learn about probability, or chance.

We have a way for you to check chance with more to look at than just heads or tails on a coin! You can have fun tossing and turning a four-sided pyramid (see page 25) to see which side lands down most often!

First, carefully cut out the pyramid. Fold and score the pieces, but **do not glue the pyramid yet!** Notice that three sides of the pyramid consist of a triangle and a flap. The pattern on the flap completes the pattern on the triangle.



Now lay the pyramid flat. Color one side (pattern) red, one side blue, one side green, and one side yellow. Then glue or tape the pyramid together as shown.

On a piece of paper, write down the colors of your pyramid. Now throw the toss 'n' turn into the air. When it lands, carefully pick it up and look underneath to see what color is on the **bottom**. Make a tally mark next to that color on your chart. Now throw the toss 'n' turn nine more times. Each time,

add a tally mark to your chart.

After the first ten throws, start a new tally sheet. When you've thrown the pyramid ten more times, start a third tally sheet.

Use your tally figures to make a table for your "Make Your Own" disk. For example, the title of the table might be "Charting Chances." The column labels would be "Colors," "First Ten," "Second Ten," "Third Ten." The row labels would be "Red," "Blue," "Green," "Yellow."

After you've completed your table, ask the computer to make graphs to show the results. Which color landed facedown most often the **first** ten times? the **second**? the **third**? Which color landed facedown the least number of times?

So now you've charted your chances, or the probability, of getting a given color the next time you throw the pyramid. For example, your chances—or odds—of the pyramid landing on red the next time you throw it are **X** (the number of times it was red) out of 10!

Check your tallies for all **three** ten-round throws. What are your chances of getting red on your next throw? ( \_\_\_ out of 30) blue? ( \_\_\_ out of 30) green? ( \_\_\_ out of 30) yellow? ( \_\_\_ out of 30)



### Event 2. Standing Long Jump

(feet and inches)

Girls Age 8	9	10	11	12	
	3'10"	4'2"	4'4"	4'8"	4'11"
Boys Age 8	9	10	11	12	
	4'2"	4'6"	4'9"	5'0"	5'4"



### Event 3. Shuttle Run

(seconds and tenths)

Girls Age 8	9	10	11	12	
	12.8	12.6	12.1	11.7	11.5
Boys Age 8	9	10	11	12	
	12.4	11.9	11.6	11.3	11.0

In the Shuttle Run, the person runs to a line 30 feet away, picks

up a block of wood, returns and places the block on the starting line, runs back and picks up a second block, and returns to the starting line.

(These are just three of the many physical fitness events used by the AAU. For more information and a list of all events, write to AAU Physical Fitness Program, AAU House, 3400 West 86th Street, Indianapolis, IN 46268.)

Check yourself on these events. And, remember, **this is not a test**. No one "passes" or "fails." It's just a chance for you to see how physically fit you are.

Add the data from your events to the table you've created. Now ask the computer to show you a bar graph to compare your data to the AAU standards!

For more physical fitness fun, ask your friends to take part in a backyard fitness program. Make a table showing how many sit-ups, etc. each kid can do. Then have the kids meet each week to train and try to become even more physically fit.

Later, recheck everyone and feed the statistics into the computer. Then look at bar graphs to show each person how he or she has improved.

# Super-Score Score Sheets

Use these score sheets to keep a record of the best scores you make playing the computer games included on your *Exploring Tables and Graphs* disk (*Level 1*:

*Left and Right*, *Blockade*; *Level 2*: *Cannon Master*, *Frog Pond*).

When a score sheet's filled, feed the scores into the computer and make graphs.



# More To Do... And How To Do It!

Now you've learned all about tables and graphs. And you've even created some tables and graphs of your own! In this section of the *User's Guide*, you'll find follow-on projects that will let you have even **more** fun with tables and graphs!

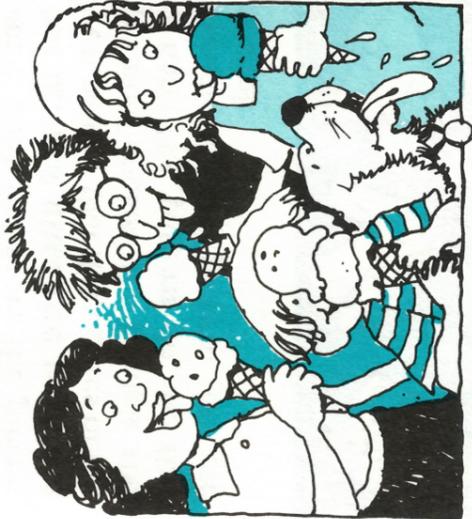
### Flavor Favorites

What's your best friend's favorite ice-cream flavor? Does your dad like that flavor best too? Do you? Make a survey and find out!

Use one of the *Take-Along Tables* on pages 27-30. Write the title of your table at the top ... something like **Favorite Flavors**. Then make a list of familiar flavors from which friends and family members will choose, such as chocolate, vanilla, strawberry, chocolate chip, butter crunch, etc. Be sure to label one category "Other." That's where you'll count the people who say they like a way-out flavor such as peanut butter-bubble gum!

Finish your survey. Then use the information to create a table on the "Make Your Own" side of the

disk. Once you've entered the data, ask the computer to make graphs to show you the results of your survey!



If you've started a data disk of your own, take it to school and use the school computer to share your results with your class. Will they be impressed!

### Toss 'n' Turn

If you throw a coin in the air and let it fall to the ground, what are the chances of heads showing up? One chance out of two, right? Will heads **or** tails show up more often if you toss the coin a number of times? Coin-tossing helps

“System Master” disk that came with the computer.

2. Put a blank disk in the disk drive.

3. Type the word NEW and press RETURN.

4. Type the words INIT DATA DISK and press RETURN.

The disk is ready when the drive stops whirring. Label the disk and keep it in a safe place.

Now when you create a table you want to keep, go to the “Loading/Saving” menu, and choose “Save a Table.” Press RETURN to light the area, type the title of your table, and press RETURN.

The computer will ask if your disk is in Drive 1 or Drive 2. (Remember, if you have only one disk drive, remove the *Exploring Tables and Graphs* disk and insert your data disk.) Use the I, M keys to show the drive you’re using. Press RETURN. The computer will ask, “Do you want to do this? (Y/N)” If everything is OK, press the Y key. The drive will start to whir.

When it stops, your table is safely stored on your own data disk. You may return the *Exploring Tables and Graphs* disk to the disk drive.

**Loading.** For Level 2 only, before you load a table, you must “Clear the Table.” If you don’t, you’ll combine any table that’s already in the computer’s memory

with the new table you want to see. The computer will ask, “Do you want to do this? (Y/N)” If everything is OK, press the Y key.

Next, choose “Load a Table,” press RETURN, and type the name of the table you want to load. Press RETURN. The computer needs to know if the table you want is in Drive 1 or Drive 2. (See note about one-disk drive on page 11.) Move the cursor to show which drive the table is stored in, and press RETURN.

Again the computer will ask, “Do you want to do this? (Y/N)” If everything is OK, press the Y key; and the table will be loaded.

When the cursor is flashing next to “Go Back,” press RETURN twice; and your table should appear on the screen!

Now ask the computer to use the data to make graphs for you!

You’ll find that you can make all sorts of tables and graphs with your *Exploring Tables and Graphs* disk. You probably have lots of ideas about the kinds of things you want to see on tables and graphs. So, make ‘em! We also have included some neat treats in this book to give you ideas . . . and materials . . . for making more and more tables and graphs!

**Have fun with the program!**



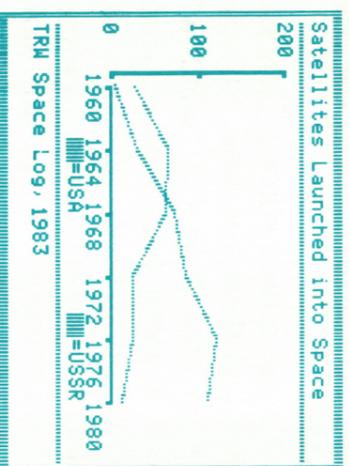




Now you've entered all the information you want on your table. Check it out. Is everything right? If not, use the I, J, K, M keys to move about and make corrections. Then, when you're finished, press ESC.

You're back at the "Make" menu. Make sure the cursor is next to "Go Back." Press RETURN.

Now you're back at the "Create a Table" menu. If you just choose "Graph," the computer will automatically make a graph of Column 1, Rows 1 through 4, even if you enter only three rows of data! (The last row will show up as 0 on your graph.) But you can tell the com-



puter to graph other columns and rows instead by picking what you want.

Choose "Pick" and press RETURN. The lighted column and rows you see on the table are what the computer has chosen to graph. The menu offers "Main Column," "Rows," "Other Column," "Go Back," "Other Column," "Go Back."

[ ] Main Column RETURN  
 [ ] Rows  
 [ ] Other Column  
 [ ] Go Back

If you want to pick a different column, move the cursor to "Main Column." Press RETURN. Use the J, K keys to choose the column you want to use as your **main column**. Press RETURN. Now press ESC.

If you want to pick different rows, be sure the cursor is next to "Rows." Press RETURN. Use the I, M keys to move the cursor to the **first row** you want on your graph. Press RETURN. That row will remain lit. Now use the I, M keys again to move to the next row you want. That row will light up. (Rows must be next to each other, you can't skip a row.)

**Pick** all of the rows you want to graph. After you pick the **last row** you want, press RETURN.

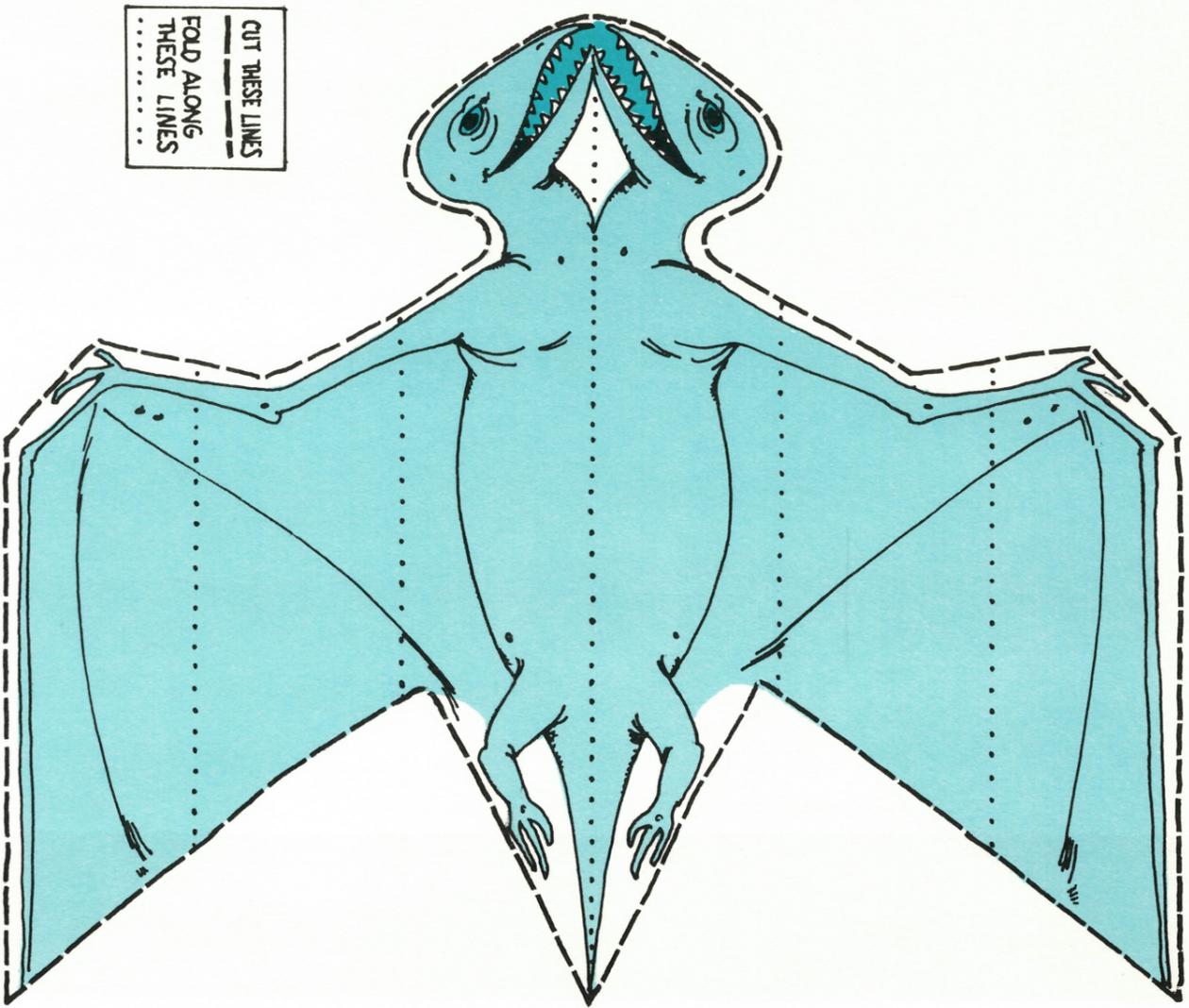
Look at the rows you've picked. If you've made a mistake or just want to **pick** different rows, press RETURN. Use the I, M keys to move the cursor to the first row you **do** want. Press RETURN. Now you can **pick** again. When everything is OK, press ESC.

If you're going to have the computer make a bar graph (or line graph, Level 2 only) for you, you can choose a second column to help you compare figures! Move



# Ptero-GRAPH-dy!

See instructions on page 15.



lights up. Now type in a title for your table. If you make a mistake, use the arrow key to move back and then retype. Then press RETURN.

Use the M key to move the flashing cursor to the bottom of the table. That's where you're supposed to put the source (it's probably you, if you're making a table from data you collected) and the date. There are two lines of space available in the source/date area. **Remember to press RETURN to light up the area, type your information, and press RETURN again.** (You'll need to remember this procedure whenever you want to put information on your table.)

Now that the title, source, and date are in place on the table, you're finished with this part of your work. Look at the words you typed. Is everything right? If not, use the I and M keys to move back to the title and source lines to make changes. **Don't forget to press RETURN before AND after you type any information.**

If everything looks right, press ESC to take you back to the "Make" menu.

Now choose "Labels/Data" and press RETURN. Use the I, J, K, and M keys to move the cursor where you want to type in column and

row labels and where you want to put the number data. (Use only whole numbers. Do not use commas within the numbers.)

Language	Speakers	Source
Chinese	226	
English	237	
Russian	274	
Spanish	258	
Hindi	254	
Arabic	135	

World Almanac and Book of Facts 1983

↑ Title/Source  
↑ Labels/Data  
↑ Go Back

**Remember to press RETURN before AND after you type any information on the table.**

On the screen you see only six rows and three columns. But the screen area is just a "window" onto a much bigger table area. There's room for 16 rows on your table; and in Level 2, there's room for six columns! To see the additional rows, press the M key to *scroll* (move) the rows up. To get back to the first row, scroll down by pressing the I key.

On the Level 2 disk, scroll toward the *left* by pressing the K key. The columns of your table will move over to make room for more columns! Send the extra columns offscreen again by pressing the J key to scroll toward the *right*!

### 'Change Table'

You can return to the table to change data (update figures) or just to look at your table information again. Move the cursor to "Change Table" and press RETURN. The table will appear on the screen. Then follow the instructions for "Create a Table" (below) to move about and change information.



If you want to get back to the "Make Your Own" menu, use the J, K keys to move the cursor to the picture of a table. Press RETURN. You'll see a menu. Move the cursor next to "Go Back" and press RETURN.

### Create a Table

You can also make graphs from scratch. But what kind of information will you use to make a graph? Look at the suggestions in

the More To Do section of this *User's Guide* (pages 13-19) for fun-to-do projects that provide data for graphs. Or use statistics from encyclopedias or newspapers.

Let's suppose you've gathered your data. The next thing you have to do is make a table! Put in your "Make Your Own" program, start it up, move the cursor next to "Create a Table," and press RETURN.

On the screen, you'll see a blank table area and a new menu that offers "Make," "Pick," "Graph," "Print," "Clear," and "Go back." (If you've been using your disk for awhile and there's a table on the screen, choose "Clear" to erase what's there and make room for your new table.) You're going to make a table, so choose "Make" and press RETURN.



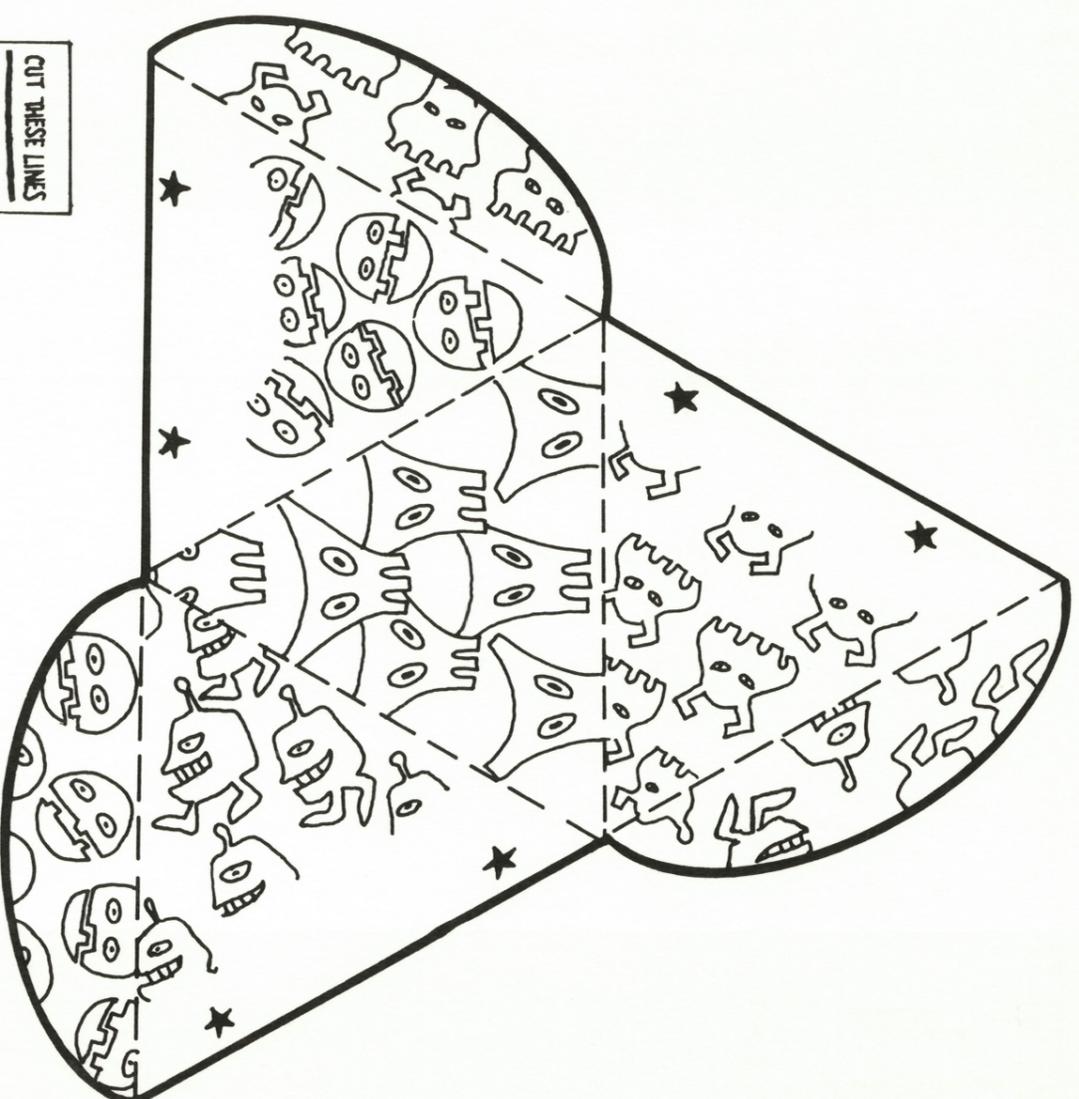
What will you see? You guessed it, another menu! This time you'll see choices such as "Title/Source," and "Labels/Data." The first thing you want to do is put a title on your table, so choose "Title/Source" and press RETURN.

You'll see the cursor flashing at the top of the table. That's where your title goes. Press RETURN. The line where the title belongs



## Toss 'n' Turn

See instructions on page 14.



CUT THESE LINES  
FOLD ALONG  
THESE LINES  
.....

value—how many things each symbol stands for.

If the computer is showing you a *bar graph* (or line graph, Level 2 only), you might want to change the color of the main bar (line), show two columns of data instead of one, or change the scale value—the top number limit on the graph.

[ ] New Graph.    ↕    RETURN  
[ ] Change Graph    ↕  
[ ] Change Table    M

### Picture Graph Changes.

Move the cursor next to “Change Graph.” Press RETURN. Look at the symbols. If you don’t see one you want, use the I, M keys to move the cursor to “New Pictures.” Use the RETURN key to go back and forth between the two sets of pictures until you find the picture you want.

Now move the cursor to “Pick Picture.” Press RETURN. Use the J, K keys to move the cursor to your choice. Then press RETURN.

To change the picture value, move the cursor to “Picture Value,” press RETURN to light the area, type in the number value you want to use, and press RETURN. (If the table shows very big numbers, it’s best not to change the picture value to an extremely small number because the picture symbols will “smear” together and

look like a bar graph.)

Make sure the cursor is next to “Graph.” Press RETURN, and your changed graph appears!

**Bar/Line Graph Changes.** To change the color of the main bar (or line, Level 2 only), move the cursor to “Color” and press RETURN. Use the J, K keys to choose the color you want, and press RETURN.

To change from one to two columns of data shown, or from two columns to just one, use the I, M keys to move the cursor to “Single/Multi.” Press RETURN. The lighted area tells you whether one or two columns of data will be shown. Press RETURN to change the lighted area.

To change the range on the graph, move the cursor to “Scale Value.” Press RETURN, type in the number value you want, and press RETURN. If you make a mistake, use the left arrow key to erase; then retype the number you want.

Be sure the cursor is next to “Graph,” press RETURN, and look at what you’ve got—just what you ordered! (If the table showed very big numbers and you changed the value to an extremely small number, the computer will flash “OVER SCALE,” which means that all of the data cannot fit in the graph area.)



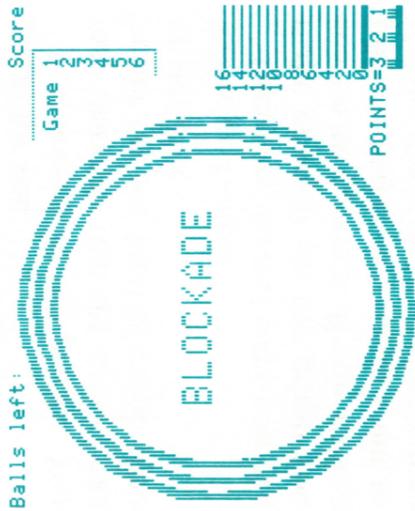


As you play, your scores are tallied. And when you are finished playing, you press any key to see your scores used in a graph of some kind.

The instructions for each game are on the disk. But we want to add a hint or two to help you:

**Left and Right (Level 1: Tables and Picture Graphs)**—Don't be fooled by the extra gray boxes that appear from time to time. You're looking for the color bar that matches—unless the color box is sitting on the gray background! Try playing this game with a partner. You control the left side and your partner controls the right. It's frantic... and fun!

**Blockade (Level 1: Bar Graphs and Area Graphs)**—Add a little body English to the paddle to help you aim and ricochet the ball at any angle. You can put a pretty good spin on the ball with a twist of the wrist!



**Cannon Master (Level 2: Tables, Picture Graphs, and Bar Graphs)**—Remember to judge the wind direction and movement before you open the jumper's parachute! The wind can cause you to drift off target. Try to angle the cannon with wind shift in mind!

**Frog Pond (Level 2: Area Graphs and Line Graphs)**—Pay attention to the messages and the graph at the bottom of the screen that tell you if you're getting warmer or colder and how close to the invisible lily pad you are!



The "Examples" on Side 1 show you many different kinds of data and how that data is used to make different kinds of graphs. The examples are lots of fun to look at over and over again!

On the "Learn About" side, the computer will ask you questions about the tables and graphs you see. This will help you learn to look for data and understand what







# Welcome to the World Of Tables and Graphs

Hi! Welcome to the wonderful world of tables and graphs! It's a world full of ways to show . . . on paper and on a computer screen . . . information you've collected about all kinds of things!

For example, on which day last week did you take the shortest time to finish your homework? On which day of the week do you usually watch the most TV shows? Do your friends watch more TV than you do? Do they watch less? Knowing how to make tables and graphs can help you show the answers to these questions!

But first, let's take a look at what tables and graphs are . . . and what they're good for.

## Words To Know

**Table:** arranges data — information — in rows and columns. A table lets you look at lots of information at one time.

**Picture Graph:** uses pictures (symbols) to show amounts. This kind of graph catches the attention of the graph reader by showing things rather than numbers.



**Bar Graph:** uses strips of color to show amounts. This kind of graph is very useful for making comparisons of two or more sets of data.

**Area Graph:** (sometimes called a **pie graph**) shows the relationship of each part to the whole.

# OFFICIAL AWARD

This is to certify that

has successfully completed the **WEEKLY READER**



## Exploring Tables and Graphs Computer Program

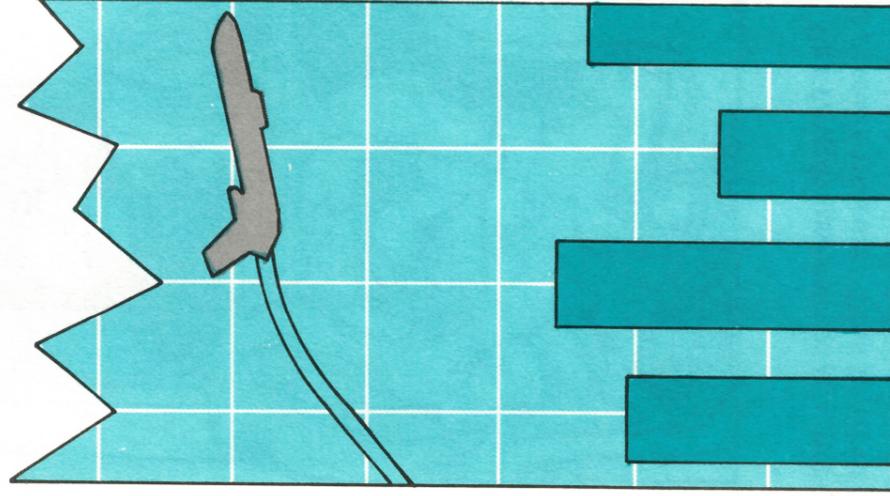
Signed \_\_\_\_\_

Director, Computer Education

Date \_\_\_\_\_

# Exploring Tables and Graphs

## User's Guide



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Written by Shirley C. Granahan  
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