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It is my hope that you find the file of use to you personally – I know that I would have liked to have found some of these files years ago – they would have saved me a lot of time !

Colin Hinson

In the village of Blunham, Bedfordshire.



# TEXAS INSTRUMENTS HOME COMPUTER

MILLIKEN MATH SEQUENCES:

## MULTIPLICATION

EDUCATION

### SOLID STATE CARTRIDGE

A self-paced multiplication "tutor" to help your child develop strong math skills to meet today's and tomorrow's challenges. Suitable for children from grades three through eight.

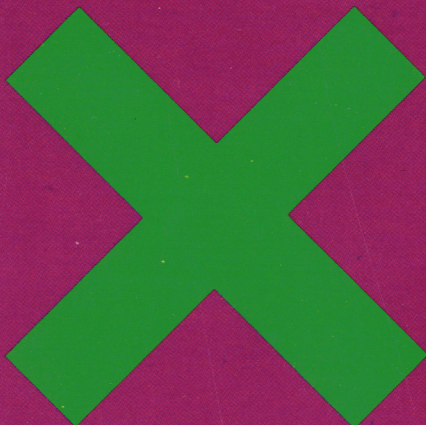
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# **Quick Reference Guide**

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To take full advantage of the features and benefits of this cartridge, please read this manual completely. Important keystroke sequences are summarized here for your quick reference.

- |                  |   |
|------------------|---|
| <b>ENTER</b>     | Proceeds to next problem or continues problem after an incorrect answer has been given. Proceeds to the next step of a problem in the "Let Me Help You" feature. Also used to enter Beginning Level and Name. |
| <b>SPACE BAR</b> | Tells the computer you want to use the regrouping (carrying) option.  |
| <b>E</b>         | Tells the computer you want to quit ("exit") the work session or leave a particular level.  |



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# ***Milliken Math Sequences: Multiplication***

This Solid State Cartridge is designed to be used with the Texas Instruments Home Computer. One in a series of twelve cartridges, it can help your child develop the strong math skills needed in today's and tomorrow's world. Suitable for children from grades three through eight.

Programmed by: John Plaster

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Program and database contents

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See important warranty information at back of book.

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### A NOTE TO PARENTS

Children need strong math skills to solve today's and tomorrow's problems. The Milliken Math Sequences, along with the TI Home Computer, can help your child meet these challenges. The series allows children to work at their own pace and on the skill level at which they need practice. Children find that learning with the computer is fun, challenging, and motivating. The computer never tires of repetition or loses patience—it's like having a private math tutor!

The Milliken Math Sequences, developed for Texas Instruments by Milliken Publishing Company, consists of twelve Solid State Cartridges. Each cartridge concentrates on a different skill area in mathematics, such as addition, multiplication, decimals, or fractions. By providing different levels of difficulty, the series is suitable for children from the kindergarten age through grade eight.

The Multiplication cartridge is divided into 62 levels of difficulty, covering material generally taught in grades three through eight. The program provides practice in multiplying whole numbers (numbers with no fractional part). Children begin multiplying one-digit numbers and advance level by level until they are multiplying with four-digit numbers. Problems are presented both vertically and horizontally. At more difficult levels (levels 33-62), children practice "regrouping" ("carrying") of numbers from one column to another.



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## ***Multiplication***

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The Multiplication cartridge offers several special features that increase its motivational and reinforcement value:

- Colorful, rewarding graphics and sound effects that appear in response to correct answers.
- An unthreatening, try-again approach to incorrect answers.
- A progress report posted at the bottom of the screen.
- Periodic reviews to maintain skill mastery.
- A “help” feature that displays the problem step by step until the final answer is found.
- Advancement to the next level if problems are answered correctly, or automatic return to a lower level if your child needs more practice.
- A special regrouping feature to help students understand the concept of carrying from one column to another.
- Report screens personalized with your child’s name at the end of each level’s activities.
- An “Exit” screen with a complete report on your child’s score at the end of the work session.

### YOUR CHILD AND THE COMPUTER

The Texas Instruments computer is a rugged, durable device designed for easy use and care. Teach your child to give the computer the same good care and respect he or she would give a television set, record player, or any piece of electronic equipment:

1. Keep snacks and beverages away from the console.
2. Don't hammer on the keyboard or place heavy objects on it.
3. Don't touch the cartridge contacts. These are recessed in the cartridge to help prevent accidental soiling and/or damage.

The letters and numbers on the keyboard are arranged in the same order found on standard typewriter keyboards. If your child is not familiar with a typewriter or has not used the computer before, take a few minutes to acquaint him or her with the keyboard. Point out the row of number keys at the top and the rows of letter keys below. Show your child how to insert the cartridge and how to select the activities. This brief "tour" of the computer will help reinforce the correct procedures for your child and instill confidence as he or she starts out in a new world of computers.

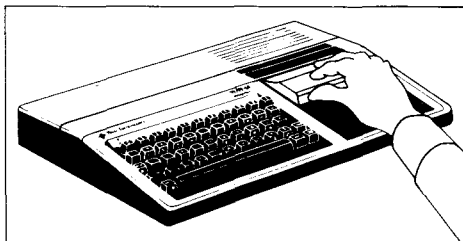
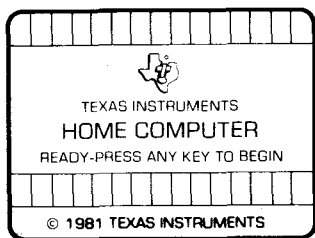
Today computers are involved in almost every aspect of life. Working with this cartridge can help your child become familiar with computers and their operation. Since computer-aided instruction is more common in the classroom every year, this knowledge can give your child an important advantage.



## USING THE SOLID STATE CARTRIDGE

An automatic reset feature is built into the computer. When a cartridge is inserted into the console, the computer returns to the master title screen. All data or program material you have entered will be erased.

*Note:* Be sure the cartridge is free of static electricity before inserting it into the computer (see page 14).



1. Turn the computer ON, and wait for the master title screen to appear. Then slide the cartridge into the slot on the console.
2. Press any key to make the master selection list appear. To select the cartridge, press the key corresponding to the number beside MILLIKEN on the list.

*Note:* To remove the cartridge, *first* return the computer to the master title screen by pressing QUIT. *Then* remove the cartridge from the slot. If you have any problem inserting the cartridge, or if it is accidentally removed from the slot while in use, please see "In Case of Difficulty" on page 14.



## A SAMPLE ACTIVITY

For easy use, directions are displayed on the screen throughout all the levels. This sample activity, however, can help to illustrate the way the program works.

### Let's Begin

When the Milliken title screen appears, press any key to begin. The screen then prompts you to enter the Beginning Level. Select any level from 1 to 62 by typing the number and then pressing **ENTER**. For this example, press **3** and **ENTER**. Next, the screen asks for Name. Type your child's name (up to ten letters long) and press **ENTER**.

Now a multiplication problem is displayed on the screen. A flashing question mark shows where the answer will go, and the directions on the screen tell you to "Enter the correct number." A progress report appears across the bottom of the screen, with the following meanings:

PL	=	Problem Level
TC	=	Total Correct
TP	=	Total Problems
AVG	=	Average

As your child works through the problems, these figures are updated to report his or her progress. TC, TP, and AVG are automatically reset to zero at the beginning of each level.

### Entering Answers

Let your child answer a few problems as you observe. He or she simply presses the correct number from the top row of keys. If the answer to be entered is more than one digit, the right-most digit must be entered first, as indicated by the flashing question mark. In other words, problems must be solved from right to left, just as they would be in the traditional pencil-and-paper method. This method reinforces the correct order of problem solution. (When selecting Beginning Level numbers, enter from left to right.)



## How the Computer Responds

If the problem is answered correctly, an animated picture appears. Your child then presses **ENTER** to continue to the next problem. If the problem is answered incorrectly, the computer returns a screen message and encourages your child to press **ENTER** to try again.

If a second incorrect answer is given, the screen border turns red and flashes. On the more complex problems (Level 45 and up), as many as five tries are given before the screen border flashes red. To continue, your child presses **ENTER** again, and the computer gives the answer, with a message to "Study the Answer." When your child presses **ENTER** again, the next problem appears.

## Advancing or Moving Back

If your child answers five of the previous six problems correctly, a "Good News" report is displayed. He or she then advances to the next level. If three problems in a row are answered incorrectly, a "Bad News" report appears, and your child moves back one level.

## Changing Levels

You can change levels any time the question mark is flashing. To leave this level, simply press the letter **E** for "exit." An "Exit" screen appears, which reports on your child's progress. Press **ENTER** to return to the title screen.

Let's try another level. Press any key to go to the "Levels 1-62" screen. This time, enter **50** (from left to right) as the Beginning Level. Then type your child's name again, and press **ENTER** to continue.

## Regrouping

At Level 50 your child is given the choice of regrouping (carrying) visually on the screen or of regrouping mentally without displaying the process. To use the regrouping option, press the **SPACE BAR** when instructed on the screen. A small question mark appears above the column to which the value is being carried or regrouped. Type the number to be carried, multiply the correct digits, and type the product. The regrouping option is offered whenever appropriate in Levels 33 through 62 (no regrouping necessary in Level 36).

### **“Let Me Help You”**

Now let's try the “Let Me Help You” feature. On the next problem, deliberately enter wrong answers until the border flashes red. Press **ENTER** and the message “Let Me Help You” is displayed. Keep pressing **ENTER** as the computer completes the problem step by step, including regrouping, until the final answer is found. Thus, if your child has difficulty with a particular problem, the computer demonstrates the solution.

Continue to observe as your child works through the problems and gains familiarity with the program's operations.



## SKILL LEVELS

This chart can help you find the appropriate starting level for your child. By looking at the sample problems and the skill description, select a level that is not too easy, but also not too difficult, for him or her. If in doubt, start at a lower level and work up from there. You may wish to select a REVIEW level first to see if your child has mastered the skill levels up to that point. A glossary is provided on page 13.

$$\text{MULTIPLIER} \times \text{MULTIPLICAND} = \text{PRODUCT}$$

$$\begin{array}{r} \text{MULTIPLICAND} \\ \times \text{MULTIPLIER} \\ \hline \text{PRODUCT} \end{array}$$

Level	Sample Problem	Skill Description
1	$4 \times 2 = ?$	Multiplying with multipliers from 1 through 5; multiplicands 1, 2, 5, and 10.
2	$\begin{array}{r} 5 \\ \times 3 \\ \hline ?? \end{array}$	
3	REVIEW	
4	$4 \times 10 = ?$	Multiplying with multipliers from 1 through 5; multiplicands from 1 through 5 and 10.
5	$\begin{array}{r} 4 \\ \times 5 \\ \hline ?? \end{array}$	
6-7	REVIEW	
8	$9 \times 10 = ?$	Multiplying with multipliers 0, 6, 7, 8, 9; multiplicands 1, 2, 5, 10.
9	$\begin{array}{r} 5 \\ \times 9 \\ \hline ?? \end{array}$	
10-11	REVIEW	

# TEXAS INSTRUMENTS HOME COMPUTER

Level	Sample Problem	Skill Description
12	$9 \times 10 = ?$	Multiplying with multipliers 0, 6, 7, 8, 9; multiplicands from 1 through 5 and 10.
13	$\begin{array}{r} 3 \\ \times 9 \\ \hline ?? \end{array}$	
14-15	REVIEW	
16	$9 \times 5 = ?$	Multiplying with multipliers from 0 through 9; multiplicands from 1 through 5 and 10.
17	$\begin{array}{r} 5 \\ \times 7 \\ \hline ?? \end{array}$	
18-19	REVIEW	
20	$5 \times 9 = ?$	Multiplying with multipliers from 0 through 5; multiplicands from 6 through 9.
21	$\begin{array}{r} 9 \\ \times 4 \\ \hline ?? \end{array}$	
22	REVIEW	
23	$9 \times 7 = ?$	Multiplying with multipliers from 0 through 9; multiplicands from 6 through 9.
24	$\begin{array}{r} 8 \\ \times 7 \\ \hline ?? \end{array}$	
25	REVIEW	
26-27	$3 \times 10 = ?$	Multiplying with multipliers from 0 through 9; multiplicands from 0 through 10.
28-29	$\begin{array}{r} 8 \\ \times 6 \\ \hline ?? \end{array}$	
30	REVIEW	
31	$\begin{array}{r} 7000 \\ \times 9 \\ \hline ????? \end{array}$	Multiplying with multipliers from 0 through 9; multiplicands from 10 through 9000 (multiples of ten).



# Multiplication

Level	Sample Problem	Skill Description
32	$\begin{array}{r} 12 \\ \times 2 \\ \hline ?? \end{array}$	Multiplying with multipliers from 0 through 9; multiplicands from 10 through 81. No regrouping.
33-35	$\begin{array}{r} 13 \\ \times 7 \\ \hline ?? \end{array}$	Multiplying with multipliers from 0 through 9; multiplicands from 11 through 19. Some regrouping.
36	$\begin{array}{r} 123 \\ \times 3 \\ \hline ??? \end{array}$	Multiplying with multipliers from 0 through 5; multiplicands from 100 through 999. No regrouping.
37-39	$\begin{array}{r} 246 \\ \times 7 \\ \hline ???? \end{array}$	Multiplying with multipliers from 0 through 9; multiplicands from 100 through 999. Some regrouping.
40-42	$\begin{array}{r} 7083 \\ \times 9 \\ \hline ????? \end{array}$	Multiplying with multipliers from 0 through 9; multiplicands from 1000 through 9999. Some regrouping.
43-44	$\begin{array}{r} 87 \\ \times 20 \\ \hline ???? \end{array}$	Multiplying with multipliers from 10 through 90 (multiples of 10); multiplicands from 10 through 99. Some regrouping.
48-49	$\begin{array}{r} 74 \\ \times 46 \\ \hline ???? \end{array}$	REVIEW: multiplying with multipliers from 0 through 99; multiplicands from 10 through 99. Some regrouping.

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Level	Sample Problem	Skill Description
50	$\begin{array}{r} 347 \\ \times 20 \\ \hline \end{array}$ ????	Multiplying with multipliers from 10 through 90 (multiples of 10); multiplicands from 100 through 999. Regrouping.
51-52	$\begin{array}{r} 476 \\ \times 29 \\ \hline \end{array}$ ????	Multiplying with multipliers from 10 through 99; multiplicands from 100 through 999. Some regrouping.
53-54	$\begin{array}{r} 739 \\ \times 57 \\ \hline \end{array}$ ?????	REVIEW: multiplying with multipliers from 0 through 99; multiplicands from 100 through 999. Regrouping.
55	$\begin{array}{r} 4568 \\ \times 40 \\ \hline \end{array}$ ?????	Multiplying with multipliers from 10 through 90 (multiples of ten); multiplicands from 1000 through 9999. Regrouping.
56-57	$\begin{array}{r} 5809 \\ \times 48 \\ \hline \end{array}$ ?????	Multiplying with multipliers from 10 through 99; multiplicands from 1000 through 9999. Regrouping.
58-59	$\begin{array}{r} 7186 \\ \times 56 \\ \hline \end{array}$ ?????	REVIEW: multiplying with multipliers from 0 through 99; multiplicands from 1000 through 9999. Regrouping.
60	$\begin{array}{r} 4768 \\ \times 500 \\ \hline \end{array}$ ?????	Multiplying with multipliers from 100 through 900 (multiples of 100); multiplicands from 1000 through 9999. Some regrouping.



Level	Sample Problem	Skill Description
61-62	$\begin{array}{r} 3769 \\ \times 385 \\ \hline \end{array}$ <p>?????</p>	Multiplying with multipliers from 100 through 999; multiplicands from 1000 through 9999. Regrouping.

## GLOSSARY

**digit:** Any of the numerals 0 to 9; for example, the numeral “986” has three digits.

**factor:** Any of the numbers in mathematics that when multiplied together form a product. Multiplicands and multipliers are both factors.

**multiple:** A number into which another can be divided with zero remainder.

**multiplicand:** A number that is multiplied by another.

**multiplier:** A number by which another number is multiplied.

**product:** The result of two numbers multiplied together.

MULTIPLIER  $\times$  MULTIPLICAND = PRODUCT

MULTIPLICAND

$\times$  MULTIPLIER

PRODUCT

**regrouping:** A process in multiplication by which numbers are formed into a new grouping, depending on their place values (units, tens, hundreds, etc.). This has traditionally been called “carrying.”



Texas Instruments invented the integrated circuit,  
the microprocessor, and the microcomputer.  
Being first is our tradition.



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