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In order to generate this file, I need to scan the pages, split the double pages and remove any edge marks such as punch holes, clean up the pages, set the relevant pages to be all the same size and alignment. I then run Omnipage (OCR) to generate the searchable text and then generate the pdf file.

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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: MEASUREMENT FORMULAS EDUCATION

SOLID STATE CARTRIDGE

A self-paced tutor which presents a variety of geometric problems involving perimeter, area, and volume measurement. Suitable for children from grades 6 through 8.

A **Milliken** **Measurement**

SXS **Measurement** **Formulas** *Find the volume of the cube*

Find the value of L and W to be multiplied in order to obtain area

Perimeter

C U B E

Choose the correct formula to find

AREA **516 cm**

VOLUME **1516 cm**

Quick Reference Guide

Note that the key sequences required to access special functions depend on the type of computer console you have. Important keystroke sequences are summarized here for your quick reference.

| | | |
|-------------------|-------------------|---|
| TI-99/4 ENTER | TI-99/4A ENTER | 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. |
| SHIFT S (←) | FCTN S (←) | Allows you to move the cursor back to correct errors on the "Levels 1-25" screen before pressing ENTER. |
| 1, 2, 3, 4 | 1, 2, 3, 4 | Selects from four possible answers displayed on the screen at Levels 4, 7, 8, 12, 15, 16, 20, 24, and 25. |
| E | E | Tells the computer you want to quit ("exit") the work session or leave a particular level. |
| SHIFT Q (QUIT) | FCTN = (QUIT) | Returns to the master title screen. |

Milliken Math Sequences: Measurement Formulas

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 six through eight.

Programmed by: John Plaster

Book developed and written by: Staff members of Texas Instruments Creative Communications.

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Program and data base contents

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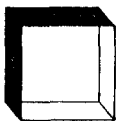
See important warranty information at back of book.

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 working 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, subtraction, decimals, or measurement formulas. By providing different levels of difficulty, the series is suitable for children from the kindergarten age through grade eight.

The Measurement Formulas cartridge is divided into 25 levels of difficulty, covering material generally taught in grades six through eight. The program provides practice in a variety of skills related to measurement formulas, including finding the perimeter, area, and volume of several geometric shapes. Where necessary, the appropriate formulas are given when a particular measurement is required. Children are periodically given problems similar to those from earlier levels for review. This program assumes that your child has mastered basic arithmetic and a certain degree of mental computation.



The Measurement Formulas 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.
- 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.
- 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.

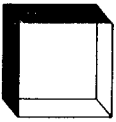
YOUR CHILD AND THE COMPUTER

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 correct procedures and instill confidence as your child starts out in a new world of computers.

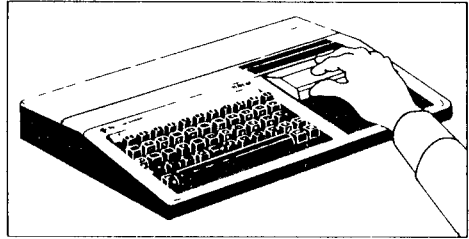
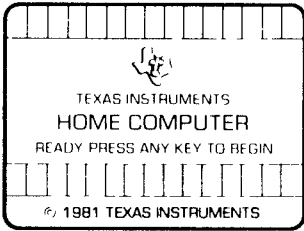
Today computers are involved in almost every aspect of life . Working with this cartridge can help your child become familiar with computers and their operation. Since computer-aided instruction is more common in the classroom every year, this knowledge can give your child an important advantage.



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 15).



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 15.

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

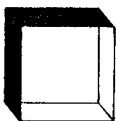
When the Milliken title screen appears, press any key to begin. The screen then prompts you to enter the Beginning Level. Select any level from 1 to 25 by typing the number and then pressing **ENTER**. For this example, press **4** and then press **ENTER**. Next, the screen asks for Name. Type your child's name (up to ten letters long) and press **ENTER**.

Now a problem is displayed on the screen. A flashing question mark shows you where the answer will go. The screen asks you to "FIND THE PERIMETER," and the directions on the screen tell you to "ENTER THE CORRECT NUMBER." Given the displayed rectangle's given length and width, your child must select the correct perimeter for the rectangle from four possible solutions appearing on the screen.

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 or numbers from the top row of keys.

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 which encourages your child to press **ENTER** to try again.

If a second incorrect answer is given, the screen border turns red and flashes. 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. (Note: Answers are evaluated according to the definitions in the glossary.)

Advancing or Moving Back

If your child answers at least three 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 Milliken title screen.

Let's try another level. Press any key to go to the "Levels 1-25" screen. This time, enter **9** as the Beginning Level. Then type your child's name again, and press **ENTER** to continue.

Problems at Level 9 involve finding the area for the displayed rectangle by determining which numbers must be multiplied. Directions on the screen ask you to "FIND THE AREA." From the rectangle on the screen, your child must decide which number represents length and which represents width in order to find the area of the rectangle. A flashing question mark shows where the answer will go, and the message on the screen tells your child to "ENTER THE CORRECT NUMBER." Your child computes the problem mentally, and types the correct answer.

Let's change to still another level. Press **E**, then **ENTER**, and then any key to return to the "Beginning Level" screen. Type **18** and press **ENTER**. Then type the child's name, press **ENTER** again, and you see the first problem in Level 18.

Problems at Level 18 involve finding the volume of a rectangular polyhedron (three-dimensional rectangle) on the screen. By multiplying the values for the polyhedron's length, width, and height, you child computes the problem mentally and types the correct answer.

"Let Me Help You"

Now let's try the "Let Me Help You" feature. On the next problem, deliberately enter a wrong answer twice. When 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, until the final answer is found. Thus, if your child has difficulty with a particular problem, the computer demonstrates the solution. (Note: This feature only appears on appropriate levels.)

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. A glossary is provided on page 14.

| Level | Sample Problem | Skill Description |
|-------|--|---|
| 1 | $P = (2 \times L) + (2 \times W)$ $P = (2 \times \underline{\quad ? \quad}) + (2 \times \underline{\quad})$ | Finding the correct values for L (length) and W (width) in order to obtain the perimeter of a rectangle. |
| 2 | $P = (2 \times L) + (2 \times W)$ $P = (2 \times 20) + (2 \times 7)$ $P = \underline{\quad ? \quad} \text{ cm}$ | Finding the perimeter of a rectangle. |
| 3 | $P = (2 \times L) + (2 \times W)$ $P = (2 \times \underline{\quad ? \quad}) + (2 \times \underline{\quad})$ $P = \underline{\quad} \text{ cm}$ | Review of Levels 1 and 2. Finding the values of L and W. Finding the perimeter of a rectangle. |
| 4 | 1) $P = 53 \text{ sq cm}$ 2) $P = 54 \text{ cm}$ 3) $P = 45 \text{ sq cm}$ 4) $P = 50 \text{ cm}$ | Further review of Levels 1 and 2. Finding the perimeter of a rectangle and choosing the number of the correct answer. |

TEXAS INSTRUMENTS HOME COMPUTER

| Level | Sample Problem | Skill Description |
|-------|--|---|
| 5 | $P = 4 \times S$ $P = 4 \times \underline{\quad}$ | Finding the correct value for S (side) in order to obtain the perimeter of the square. |
| 6 | $P = 4 \times S$ $P = 4 \times \underline{\quad}$ $P = \underline{\quad}$ | Finding the value of S. Finding the perimeter of a square. |
| 7 | 1) $P = 18$ cm 2) $P = 25$ sq cm 3) $P = 20$ cm 4) $P = 21$ sq cm | Finding the perimeter of a square and choosing the number of the correct answer. |
| 8 | 1) $P = (2 \times L) + (2 \times W)$ 2) $P = L + W$ 3) $P = (2 \times L) + W$ 4) $P = 4 \times S$ | Review of Levels 1 through 7. Choosing the correct formula to find the perimeter of either a rectangle or a square that is alternately displayed on the screen and choosing the number of the correct answer. |
| 9 | $A = L \times W$ $A = \underline{\quad} \times \underline{\quad}$ | Finding the values of L and W in order to obtain the area of a rectangle. |
| 10 | $A = L \times W$ $A = 12 \times 4$ $A = \underline{\quad}$ sq cm | Finding the area of a rectangle. |
| 11 | $A = L \times W$ $A = \underline{\quad} \times \underline{\quad}$ $A = \underline{\quad}$ sq cm | Review of Levels 9 and 10. Finding the values of L and W. Finding the area of a rectangle. |

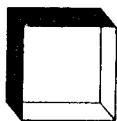


Measurement Formulas

| Level | Sample Problem | Skill Description |
|-------|--|---|
| 12 | 1) $A = 66$ cm 2) $A = 63$ sq cm 3) $A = 64$ sq cm 4) $A = 68$ sq cm | Further review of Levels 9 and 10. Finding the area of the rectangle on the screen and choosing the number of the correct answer. |
| 13 | $A = S \times S$ $A = ? \times \underline{\quad}$ | Finding the value of S to obtain the area of a square. |
| 14 | $A = S \times S$ $A = ? \times \underline{\quad}$ $A = \underline{\quad}$ sq cm | Finding the value of S. Finding the area of a square. |
| 15 | 1) $A = 4$ sq cm 2) $A = 5$ cm 3) $A = 6$ sq cm 4) $A = 2$ sq cm | Review of Levels 13 and 14. Finding the area of the square on the screen and choosing the number of the correct answer. |
| 16 | 1) $A = L \times W$ 2) $A = (2 \times W) + L$ 3) $A = S \times S$ 4) $A = 4 \times S$ | Review of Levels 9 through 15. Choosing the correct formula to find the area of either a rectangle or a square that is alternately displayed on the screen and choosing the number of the correct answer. |
| 17 | $V = L \times W \times H$ $V = ? \times \underline{\quad} \times \underline{\quad}$ | Finding the values for L (length), W (width), and H (height) in order to obtain the volume of the rectangular polyhedron. |

TEXAS INSTRUMENTS HOME COMPUTER

| Level | Sample Problem | Skill Description |
|-------|---|---|
| 18 | $V = L \times W \times H$ $V = 5 \times 3 \times 5$ $V = \underline{\quad} \text{ cu cm}$ | Finding the volume of a rectangular polyhedron. |
| 19 | $V = L \times W \times H$ $V = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$ $V = \underline{\quad} \text{ cu cm}$ | Review of Levels 17 and 18. Finding the values of L, W, and H. Finding the volume of a rectangular polyhedron. |
| 20 | 1) $V = 58 \text{ sq cm}$ 2) $V = 60 \text{ cu cm}$ 3) $V = 63 \text{ cu cm}$ 4) $V = 68 \text{ sq cm}$ | Further review of Levels 17 and 18. Finding the volume of the rectangular polyhedron and choosing the number of the correct answer. |
| 21 | $V = S \times S \times S$ $V = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$ | Finding the value of S (side) in order to find the volume of a cube-shaped polyhedron. |
| 22 | $V = S \times S \times S$ $V = 5 \times 5 \times 5$ $V = \underline{\quad} \text{ cu cm}$ | Finding the volume of a cube-shaped polyhedron. |
| 23 | $V = S \times S \times S$ $V = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$ $V = \underline{\quad}?$ | Review of Levels 21 and 22. Finding the value of S. Finding the volume of the cube-shaped polyhedron. |



Measurement Formulas

| Level | Sample Problem | Skill Description |
|-------|--|--|
| 24 | 1) $V = 516 \text{ sq cm}$ 2) $V = 515 \text{ cu cm}$ 3) $V = 512 \text{ cu cm}$ 4) $V = 509 \text{ cu cm}$ | Further review of Levels 21 and 22. Finding the volume of a cube-shaped polyhedron and choosing the number of the correct answer. |
| 25 | 1) $V = L \times W \times H$ 2) $V = S \times S \times S$ 3) $V = L \times W$ 4) $V = (2 \times L) + W$ | Review of Levels 17 through 24. Choosing the correct formula to find the volume of either a rectangular polyhedron or a cube-shaped polyhedron that is alternately displayed on the screen and choosing the number of the correct answer. |

GLOSSARY

Area: the amount of surface included within a closed, two-dimensional figure; for example,

$$A (\text{rectangle}) = \underline{\text{Length}} \times \underline{\text{Width}}$$

$$A (\text{square}) = \underline{\text{Side}} \times \underline{\text{Side}}$$

Centimeter: a unit of measurement equal to 0.01 meters or .39 inches; for example, 100 centimeters = 1 meter.

Cube: a three-dimensional solid consisting of six equal square sides.

Cubic Centimeter: a cubic unit of volume in which the length of each edge equals one centimeter; for example, 1 cm × 1 cm × 1 cm = 1 cu cm

Perimeter: the boundary of a closed two-dimensional figure; for example,

$$P (\text{rectangle}) = (2 \times \underline{\text{Length}}) + (2 \times \underline{\text{Width}})$$

$$P (\text{square}) = 4 \times \underline{\text{Side}}$$

Polyhedron: a three-dimensional closed figure which has no curved edges.

Rectangle: a four-sided, two-dimensional closed figure in which all angles are right angles.

Square: a rectangle with all four sides equal.

Square centimeter: a square which measures one centimeter on each side, the product of which is a centimeter multiplied by itself; for example, cm × cm = sq cm

Volume: an amount of space occupied by three-dimensional objects measured in cubic units; for example, to obtain the volume of a rectangular polyhedron:

$$V (\text{rectangle}) = \underline{\text{Length}} \times \underline{\text{Width}} \times \underline{\text{Height}}$$

To obtain the volume of a cube-shaped polyhedron, the above formula remains the same. However, since all sides of a cube are equal, the volume of a cube-shaped polyhedron may be obtained using this similar formula:

$$V (\text{cube}) = \underline{\text{Side}} \times \underline{\text{Side}} \times \underline{\text{Side}}$$



CARING FOR THE CARTRIDGE

These cartridges are durable devices, but they should be handled with the same care you would give any other piece of electronic equipment. Keep the cartridge clean and dry, and don't touch the recessed contacts.

CAUTION:

The contents of a Solid State Cartridge can be damaged by static electricity discharges.

Static electricity build-ups are more likely to occur when the natural humidity of the air is low (during winter or in areas with dry climates). To avoid damaging the cartridge, just touch any metal object (a doorknob, a desk lamp, etc.) before handling the cartridge.

If static electricity is a problem where you live, you may want to buy a special carpet treatment that reduces static build-up. These commercial preparations are usually available from local hardware and office supply stores.

IN CASE OF DIFFICULTY

If the cartridge activities do not appear to be operating properly, return to the master title screen by pressing **QUIT**. Withdraw the cartridge, align it with the cartridge opening, and reinsert it carefully. Then press any key to make the master selection screen appear. (*Note:* In some instances, it may be necessary to turn the computer off, wait several seconds, and then turn it on again.)

If the cartridge is accidentally removed from the slot while the cartridge contents are being used, the computer may behave erratically. To restore the computer to normal operation, turn the computer console off, and wait a few seconds. Then reinsert the cartridge, and turn the computer on again.

If you have any difficulty with your computer or cartridge, please contact the dealer from whom you purchased the unit and/or cartridge for service directions.

Additional information concerning use and service can be found in your *User's Reference Guide*.

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



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