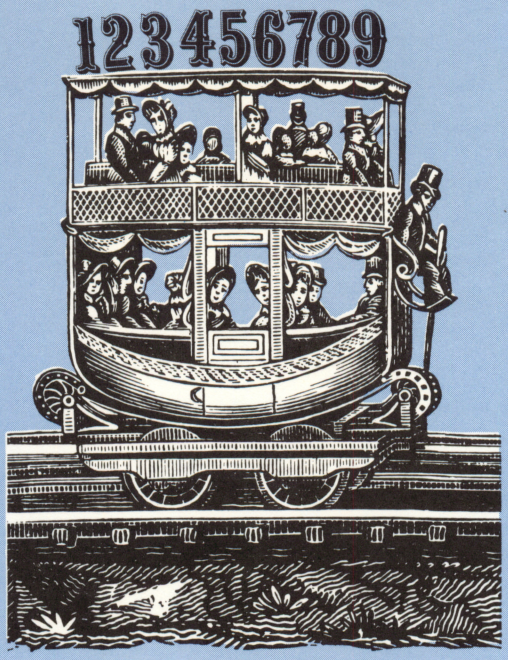
High School Math Competency Series



MATHEMATICS

MICROCOMPUTER WORKSHOPS COURSEWARE

Auburn Enlarged City School District
THORNTON AVE.
AUBURN, NEW YORK 13021
(315) 253-0301

High School Math Competency Series

Programmed and Designed by Celia Keenholtz

Subject: Mathematics
Grade Levels: 9 - 12

Auburn Enlarged City School District
THORNTON AVE.
AUBURN, NEW YORK 13021
(315) 253-0301

Contents

Program Objective..... 1

Program Description..... 1

Program Sequence..... 2

Student Profile Sheet..... 2

Error Analysis..... 3

Notes..... 3

Appendix - Drill Program..... 4

Disk Loading Instructions - TRS-80 Network III..... 7

Disk Loading Instructions - TRS-80 Network II..... 8

Disk Loading Instructions - Apple..... 9

Student Profile

PROGRAM OBJECTIVE

To provide students with drill and instruction in the basic high school mathematics skills.

PROGRAM DESCRIPTION

The *High School Math Competency Series (HSMCS)* is a computer based instructional program for drill and remediation in the basic skills of mathematics. The program is based on the New York State curriculum guidelines for competency in mathematics and can be used for any competency test.

The **Spanish** version of *HSMCS* is designed for non-English speaking students. The problems are identical to those in the English version, with all instructions, menus, and comments given in Spanish.

HSMCS contains fourteen drill programs that cover each of the following areas:

1 - Whole Numbers
2 - Fractions
3 - Decimals
4 - Basic Percent
5 - Primes and Factors
6 - Integers
7 - Algebra
8 - Geometry
9 - Ratio and Proportion
10 - Probability
11 - Statistics
12 - Percent Word Problems
13 - Money Problems
14 - Miscellaneous Problems

There are problems in computation, mathematical concepts, and word problems. All problems covered by these drill programs are generated randomly with the numbers, names, and items also chosen randomly, creating an almost infinite set of unique problems.

PROGRAM SEQUENCE

The *Apple* version is divided into two disks with areas 1 - 7 on Disk 1 and areas 8 - 14 on Disk 2. Once the program has been loaded, the disks (Part 1 or Part 2) can be interchanged and the new menu loaded by typing: **RUN MENU.**

The *TRS-80* version contains all fourteen programs on one disk.

Drills consisting of ten problems each can be generated in a FIXED or a MIXED mode. The teacher should tell the student in which area and mode (FIXED or MIXED) to work. When the student types the number of the assigned drill area, the drill program is loaded and the student is asked:

DO YOU WANT A FIXED OR A MIXED DRILL?

A FIXED DRILL will give one particular type of problem within the area, such as addition of decimals, or card problems in probability. In this mode, the teacher can introduce a topic or concept and have the student practice problems of that type only.

A MIXED DRILL will give several types of problems within the area, based on the number of types chosen. For example, the drill in Whole Numbers has ten different problem types, addition, subtraction, etc.; the student can review all ten problem types, or only the first four, or any combination of the first two to ten areas. For a mixed drill covering all the problem types, the student must type the highest number when asked: **HOW MANY TYPES?**

STUDENT PROFILE SHEET

The last page of this booklet contains a sample Student Profile Sheet, which may be reproduced and used by the teacher to keep a record of the practice drills taken by each student. The teacher should record the date of the drill, the type of drill (FIXED, MIXED, and type of problems), and the score. This will give a picture of the student's progress.

ERROR ANALYSIS

After the completion of 10 problems or after pressing **S** to end a drill program, an error analysis similar to the following will be given:

Your final score is:
9 correct answers
1 incorrect answers
For a grand total of 90%

Do you want to try this drill again?_
Do you want another drill?_

NOTES

- Fractions must be entered by typing the numerator and denominator separately. The student is prompted to enter the whole number first, then the numerator and the denominator.

- The letter of the correct answer must be typed for multiple choice questions.

- The **$** and **%** should not be typed with the answers.

- The **+** and **-** signs must be typed with the answers in the drill program for INTEGERS. If the **+** sign is not used when applicable, the answer will be considered incorrect.

- Exponents in the *Apple* version use standard mathematical notation. The *TRS-80* version uses BASIC notation (up arrow). For example: 10^3 is expressed as 10^3.

- Break key: In the *TRS-80* version, the break key is disabled during the program so that the student cannot stop the program at will. Typing **S** for an answer is the only way to exit the program before the 10 problems in the drill have been completed. The break key will be reactivated at the end of each drill if the student does not wish to continue.

- Rerun without rebooting:
  TRS-80 version: type **RUN "MENU"** <ENTER>.
  Apple version: type **RUN MENU** <RETURN>.

APPENDIX - DRILL PROGRAMS

Whole Numbers

1- Addition
2- Subtraction
3- Multiplication
4- Division
5- Estimation
6- Rounding
7- Place Value
8- Powers of 10
9- Square and Square Root
10- Numerals

Fractions

1- Addition
2- Subtraction
3- Multiplication
4- Division
5- Reduce Fractions
6- Convert Fraction to Decimal
7- Fraction vs. Mixed Number
8- Find Common Denominator
9- What is #/# of #?

Decimals

1- Addition
2- Subtraction
3- Multiplication
4- Division
5- Order
6- Convert Fraction to Decimal
7- Rounding

Basic Percent

1- What is X % of Y?
2- X % of What Number is Y?
3- What Percent is X of Y?
4- Convert Percent to Decimal
5- Convert Decimal to Percent
6- Convert Percent to Fraction
7- Convert Fraction to Percent
8- Express Percent as a Ratio

Prime and Factors

1- Prime Numbers
2- Common Factors
3- Prime Factors
4- Least Common Multiple
5- Test Divisibility By
6- Find Prime Number Between

Integers

1- Addition
2- Subtraction
3- Multiplication
4- Division
5- Measure Change From/To
6- Find Number Less Than

Algebra

1- Equations: A/B = C/D
2- Equations: AX + B = C
3- Equations With Negative Numbers
4- Line Graphs
5- Coordinate Graphs

Geometry

1- Area
2- Perimeter
3- Angles of a Triangle
4- Pythagorean Theory

Ratio & Proportion

1- Maps
2- Salary
3- Miles Per Gallon
4- Proportion 1/A = B/C
5- Proportion A/B = C/D
6- Ratio

Probability

1- Pick One Out of a Container
2- Cards
3- Dice
4- Spinner
5- Toss a Coin
6- Least/Greatest Chance

Statistics

1- Mean
2- Median
3- Mode

Percent Word Problems

1- Sales Tax
2- Dinner Tip
3- Find Sale Price
4- Ratio to Percent (Simple)
5- Ratio to Percent (With Addition)
6- Percent Increase
7- Interest

Money Problems

1- Change From X Dollars
2- Bank Accounts
3- Installment Plans
4- Total Cost From Parts
5- Sale Price (With Fraction Off)
6- Salary Deductions
7- Savings For Purchase

Miscellaneous Problems

1- Area and Cost
2- Metric System - Convert
3- Metric System - Terms
4- Length Left With Fraction
5- Time

DISK LOADING INSTRUCTIONS

TRS-80 Network III:

1. Boot the system as usual with the Network III software in Drive 0.
2. Insert the *HSMCS* disk in Drive 1.
3. At each student station, load the Network III system and type: **NBASIC** <ENTER>.
4. To access the *HSMCS* program from the student stations, type: **RUN "MENU:1"** <ENTER>.
5. The *HSMCS* program will LOAD and RUN.
6. The student should then type the NUMBER for the drill program assigned.
7. At the end of the drill, the student has the option to continue the same drill or choose another drill.
8. If another drill is requested, the MENU program will be accessed and the student can load a new drill program.

Notes:

- The *HSMCS* program disk can only be used in Drive 1.
- It is not necessary to reboot the system to go back to the menu program. It will load by typing: **RUN "MENU:1"**.
- The *HSMCS* program disk must remain in Drive 1 in the master computer so students can access different drill programs in the series.

TRS-80 Network II:

1. Turn on the computer.
2. Insert a DOS disk in Drive 0 and the *HSMCS* in Drive 1.
3. Press the orange reset button.
4. At the prompt, type the date (MM/DD/YY) <ENTER>.
5. Press <ENTER> for the time.
6. When the READY prompt appears, type: **BASIC** <ENTER>.
7. At the prompt, MEMORY SIZE?: <ENTER>.
8. At the prompt, HOW MANY FILES?: <ENTER>.
9. At the READY prompt type: **RUN "MENU"** <ENTER>.
10. The *HSMCS* menu program will LOAD and RUN.
11. Type the number for the program you want to download to the student stations. It will then load to the master computer.
12. At each student station, type: **CLOAD** <ENTER>.
13. When the program is loaded, the message will appear: TYPE **CSAVE"A"** WHEN THE READY PROMPT APPEARS.
14. When READY appears on the screen, type: **CSAVE"A"** <ENTER>. The program will download to each student station.
15. To load another program, type: **RUN"MENU"** <ENTER>.
16. Follow the instructions from step 11.

Notes:

- The *HSMCS* program disk is not a system disk. You must keep a DOS disk in Drive 0 and the *HSMCS* Program disk in Drive 1.

- It is not necessary to reboot the system to go back to the MENU program. It will load by typing: **RUN"MENU"**.

- <ENTER> means press the ENTER key.

- Students must type: **CLOAD** <ENTER> before the **CSAVE"A"** command is typed on the master machine.

- Check the cassette speed before downloading a program. All computers must be set at the same speed (either HIGH or LOW).

HSMCS STUDENT PROFILE

Name _____

Grade _____ **Period** _____

Drill Profile: (Record Drill Taken, Date, And Score)

Whole Numbers _____

Fractions _____

Decimals _____

Basic % _____

Primes & Factors _____

Integers _____

Algebra _____

Geometry _____

Ratio & Proportion _____

Probability _____

Statistics _____

Percent Problems _____

Money Problems _____

Misc. Problems _____

Apple **II, II+**, *IIe, IIc*

1. Remove the disk from its sleeve and place it with the label up and near you into the disk drive. (If you have more than one disk drive, place the disk in drive 1.)

2. Close the door of the disk drive and turn on the computer. Make sure that your TV or monitor is also on.

3. The program should run automatically. If this is not the case, turn off your power switches and check to see that you have connected all of your equipment correctly.

*If you have the old Apple **II** with the non-autostart ROM*, you will see an asterisk (*) when you turn on the power switch. Type the number **6**, and then while holding down the key marked **CTRL**, press **P**, release both keys, and press the key labeled **RETURN**. The program should now run automatically.

Trademark Notices

Apple and Applesoft are trademarks of Apple Computer, Inc.
TRS-80 is a trademark of Tandy Corporation

The material on the enclosed disks is copyrighted and, therefore, may not be copied.

We have included a complimentary back-up disk for each program in this package. Our disks are unconditionally guaranteed. If a disk for any reason becomes unusable, simply return it to us, and we'll send you a replacement--free of charge.

MICROCOMPUTER WORKSHOPS
COURSEWARE

225 Westchester Avenue / Port Chester, New York 10573 / (914) 937-5440