

9

Radio Shack  
19.95

6 + 2 = 8

6 x 3

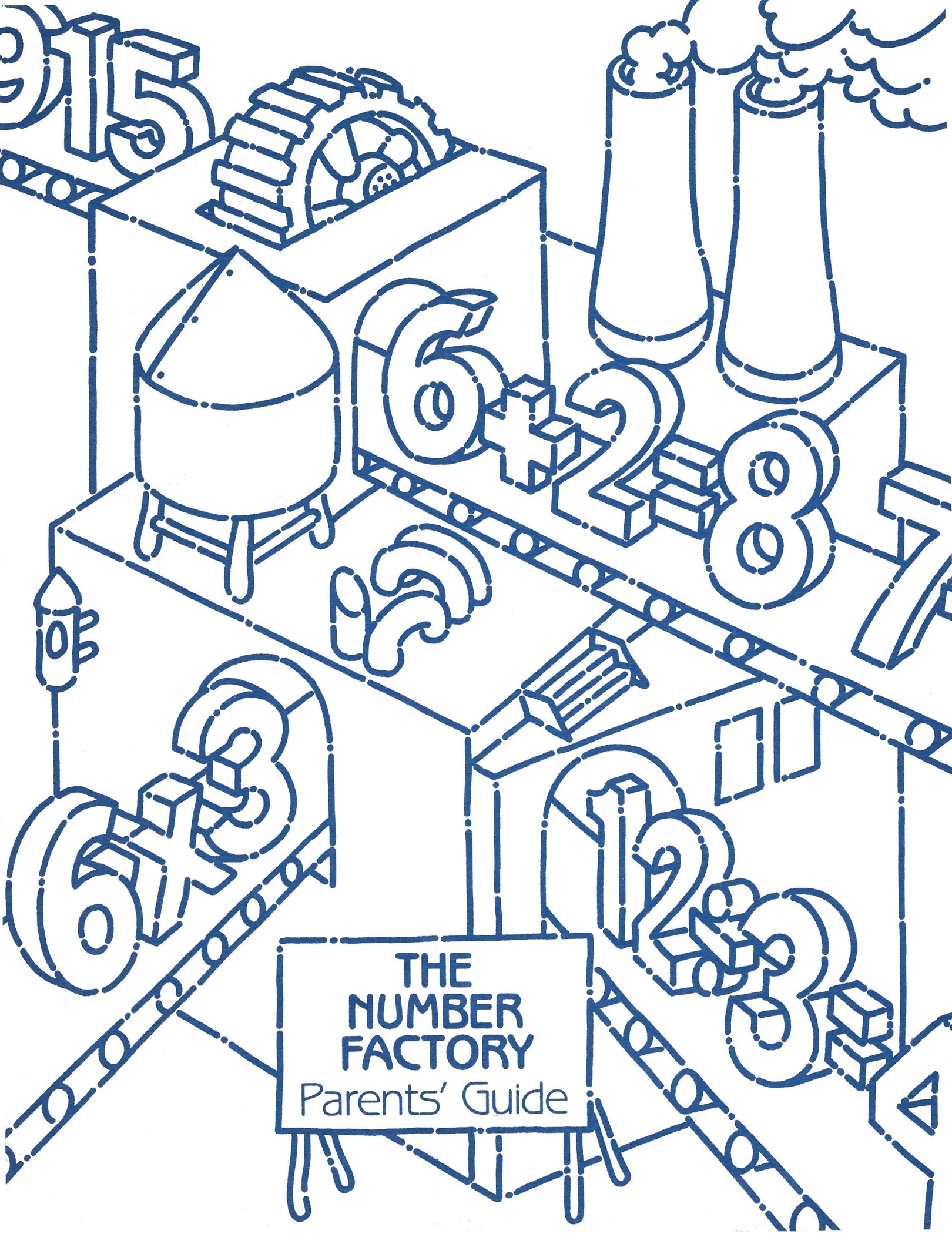
12 ÷ 3

**THE  
NUMBER  
FACTORY**  
Three elementary math games for  
the Radio Shack Electronic Book™

CAT. NO. 26-2543

**TANDY**  
COMPUTER  
PRODUCTS





**THE  
NUMBER  
FACTORY**

Parents' Guide



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## How to Use The Number Factory

THE NUMBER FACTORY offers practice in addition and subtraction, multiplication and division, and building equations. Children from the early grades through junior high can enjoy THE NUMBER FACTORY. (And you might even find the higher levels challenging yourself!) Read the directions through carefully before you start. With your help, your child will soon be able to start and run THE NUMBER FACTORY on his or her own.

### Required Equipment

- Color Computer with at least 16K RAM and Extended Color Basic
- Cassette player/recorder
- Electronic Book™
- THE NUMBER FACTORY color pages one through ten (five sheets)
- THE NUMBER FACTORY program cassette (Use side 1 for 16 K RAM; side 2 with 32-64K RAM.)

## Getting to Know The Number Factory

### FIRST:

1. Attach the Electronic Book to the right joystick port of the Color Computer, and insert pages one to ten into the Electronic Book Binder.
2. Turn on the attached TRS-80 Color Video, or any attached color television.
3. Plug in the cassette recorder and set the volume at 5. (If an error occurs, you may need to make a slight adjustment to the volume.)
4. Turn on the TRS-80 Color Computer.
5. Place THE NUMBER FACTORY cassette tape in the cassette recorder

and press REWIND. When the tape is rewound, press STOP, and then PLAY.

6. Type **P C L E A R 2** at the Color Computer keyboard and press **ENTER**. Then type **C L O A D** and press **ENTER**.
7. When *OK* appears on the screen, type **R U N** and press **ENTER**.

### NEXT:

1. The question—"Do you want the scoreboard displayed until you respond?"—will appear on the screen.
2. If you press **Y** (YES) on the computer keyboard, you will be able to check your child's progress after each set of problems. The scoreboard will remain on the screen until you press **C** (for continue) on the keyboard to continue the program.
3. If you press **N** (NO) on the keyboard, the child will be able to repeat the activity without interruption. The program will automatically resume after the scoreboard is displayed.

### THEN:

1. When *Page 3 GO* is displayed, you are ready to turn the operation over to your child and the Electronic Book.
2. Have your child turn to page 3 and press **GO**. If—after a short while—no one presses **GO**, the computer will show a short demonstration of THE NUMBER FACTORY. Then it will display *Page 3 GO* again. (The demonstration may be interrupted by pressing **GO**.)

## Using Page 3

Page 3 is where the action starts. Your child can choose from three different arithmetic activities. Page 3

is used to select one of the activities. Your child will come back to page 3 whenever he or she wants to choose a different activity. The three activities are:

- THE PROBLEM FACTORY: + - . Children identify the addition or subtraction operation of the factory as it makes new numbers from old. (Three levels of difficulty represent the ranges of numbers used: 0-5, 0-9, and 0-15 for levels 1, 2, and 3 respectively.)
- THE PROBLEM FACTORY: x ÷ . Children identify multiplication or division operations (at any of 3 levels of difficulty).
- THE EQUATION FACTORY. Children help the factory build valid mathematical equations. (There are 4 levels. Level 4 uses numbers within the range of 0-99.)

When **GO** is pressed on page 3, the words *Press Key* are displayed on the screen.

- If children press **The Problem Factory: + -**, they will see *Page 5 GO* on the screen.
- If the children press **The Problem Factory: x ÷**, they will see *Page 7 GO* on the screen.
- If the children press **The Equation Factory**, they will see *Page 9 GO* on the screen. In each case, children should turn to the designated page and press **GO** on that page. If no activity is selected, the computer will show a demonstration program.

## Using Page 5 (The Problem Factory: + -)

On page 5, you will find all the keys needed to work with "The Problem Factory: + -." To begin:

1. Press **GO**, and the words *Level = 1* will appear.
2. Select one of three levels of



difficulty by pressing **LEVEL** until you see the number of the level you want (1, 2, or 3).

3. Press **GO** again, and you are ready to start.
4. The factory will now “process” three numbers, making new numbers out of old.
5. When all three numbers have been processed, the computer will show, in boxes, a possible way of making the new numbers by adding or subtracting. Your child should change the operator (+ or -) and the number until the hidden method is found.
6. Press **+/-** to change the sign; press **#** to change the numbers.
7. When you think you have the correct solution, press **YES**.
8. If there is no response or if your answer is incorrect, the computer will flash the correct answer for 10 seconds. Then, you will be allowed to enter the correct answer.
9. When the solution is correct, a new set of problems is displayed.
10. After 5 sets of problems, your child’s score will appear on the screen. The score represents the number of seconds required to complete the problem set. The best score is the lowest time at a particular level.
11. Children can test their skill again by pressing **GO** for more addition and subtraction practice or **RESTART** to go back to page 3 to choose another activity.

### Using Page 7 (The Problem Factory: $\times \div$ )

On page 7, you will find all the keys needed to work with “The Problem Factory:  $\times \div$ .” To begin:

1. Press **GO** on page 7, and proceed just as for “The Problem Factory: + -.”
2. Remember to press  **$\times/\div$**  to change the sign. (Also remember that division by zero will not be accepted by the computer.)

### Using Page 9 (The Equation Factory)

On page 9, you will find the keys needed to work with “The Equation Factory.” To begin:

1. Press **GO** on page 9, and select your level of play. There are *four* levels, using number ranges of 0-5, 0-9, 0-15, and 0-99.
2. Press **GO** again, and you are ready to start.
3. The object of this activity is to use as many numbers as possible to “manufacture” valid equations. Your equations can have as many as seven elements ( $7 + 6 - 4 = 9$ ) or as few as three ( $6 = 6$ ). The score is based on the sum of the numbers used times the number of elements in each formula.
4. Press **#** to move the red cursor from number to number. Press **YES** to move the number you select from the factory to the top of the screen.
5. Press  **$+/-/\times/\div$**  to move the cursor among the math operators. Select one by pressing **YES**. It will appear in your

equation at the top of the screen.

6. When you have completed an equation, press **DONE**, and start another one. (If your equation is seven items long, it is not necessary to press **DONE**.)
7. To change an equation before it is completed, press **ERASE**.
8. An incorrect equation (one in which the expressions on either side of the equals sign are not equal) will not be accepted by the computer, and the numbers will be returned to the factory for reuse.
9. If no more equations are possible, but there are still numbers in the factory, press **QUIT** to see your score. The **BEST** score is retained when **SAME NUMBERS** (see below) is pressed. This allows up to seven players to compete with the same problem set. Up to seven scores will be displayed on the scoreboard.

#### Other keys on page 9 are:

- **NEW NUMBERS**  
A child can change the numbers given at the beginning of the activity by pressing this key.
- **SAME NUMBERS**  
A child can try to better a score by working with the same numbers or can challenge a friend to do better.
- **RESTART**  
A child can press this when the word “Level” is displayed to return to page 3.



# The Educational Value of The Number Factory

Addition, subtraction, multiplication, and division are universally recognized as basic skills, and they are the basis for all higher math. Unfortunately, children are often reluctant to learn "math facts" because they must memorize them, and the sheer volume of numbers involved seems more than anyone could possibly handle.

As today's children move into a world that is even more highly technical than the one we live in today, they must have strong math skills. They will be working, in almost every aspect of their lives, with some form of computer technology. Most of the functions performed by computers are based on mathematical principles. The child who slips by today with poor math skills may be at a real disadvantage in the world of tomorrow.

Schools have renewed their efforts to develop strong math skills in their students, and concerned parents are looking for ways to help. THE NUMBER FACTORY is an excellent beginning.

In addition to learning the math facts, children who work with THE NUMBER FACTORY will gain a better understanding of the theory behind the mathematical operations that we usually perform by rote. Visual reinforcement of math principles occurs when numbers go into the factory as raw material, then come out of the factory as something new. Children will discover that numbers are the raw materials in mathematical problems and that performing different operations on the same numbers produces different results.

As children work with THE NUMBER FACTORY, they will sharpen their skills in addition, subtraction, multiplication, and division of one- and two-digit numbers. They will also be using inductive and deductive reasoning and problem-solving skills as they master the different levels of this program.

Your children have to learn basic math skills. While the only way to learn these skills is to practice them through drill and repetition, some children find stark repetition tedious and boring. THE NUMBER FACTORY provides your children with an innovative and highly motivating alternative for practicing basic arithmetic skills.

## As your children work with THE NUMBER FACTORY and the Electronic Book, they will learn that they can:

- perform simple mathematical operations (addition, subtraction, multiplication, and division) and have fun at the same time.
- remember their math facts without boring memorization.
- build equations out of supplied numbers and designs.
- understand what mathematical operations do to numbers.
- find many combinations of numbers that will produce the same answers.
- correct their mistakes as they go along.
- feel confident about their math skills as they master the levels of play in THE NUMBER FACTORY.
- use inductive and deductive reasoning and problem-solving skills in math.
- get instant feedback for their efforts.
- increase their speed in solving simple arithmetic problems.

## They will also discover that math is:

- fun and exciting.
- simply a short way of expressing relationships between numbers.
- something everyone can master.
- easy to understand if you can watch it work.
- definitely worth the effort!