Scratch is the wildly popular educational programming language used by millions of first-time learners in classrooms, libraries, and homes worldwide. By dragging together colorful blocks of code, kids quickly learn computer-programming concepts and make cool games and animations.

In Super Scratch Programming Adventure!, kids learn programming fundamentals as they make their very own playable video games. They’ll create projects inspired by classic arcade games that can be programmed (and played!) in an afternoon. The book’s patient, step-by-step explanations of the code and fun programming challenges will have kids creating their own games in no time.

This full-color comic book makes programming concepts like flow control, subroutines, and data types effortless to absorb. Packed with ideas for games that kids will be proud to show off, Super Scratch Programming Adventure! is the perfect first step for the budding programmer.

ABOUT THE AUTHOR The Learning through Engineering, Art, and Design (LEAD) Project is an educational initiative established to encourage the development of creative thinking through the use of technology. Created by the Hong Kong Federation of Youth Groups in collaboration with the MIT Media Lab, the LEAD Project promotes hands-on, design-based activities to foster innovation, problem-solving skills, and technical literacy.

As you read this book, let your imagination run wild. What will you create with Scratch?

—from the foreword by Professor Mitchel Resnick, creator of Scratch

COMICS! GAMES! PROGRAMMING!

Programming is as simple as drag-and-drop!

LEARN TO PROGRAM BY MAKING COOL GAMES!

The Learning through Engineering, Art, and Design (LEAD) Project is an educational initiative established to encourage the development of creative thinking through the use of technology. Created by the Hong Kong Federation of Youth Groups in collaboration with the MIT Media Lab, the LEAD Project promotes hands-on, design-based activities to foster innovation, problem-solving skills, and technical literacy.

The finest in geek entertainment™

www.nostarch.com

Price: $24.95

For ages 8 and up

Shelve In: Computers/Programming Languages

Super Scratch Programming Adventure!

Cover: Version 1.4

Programming is as simple as drag-and-drop!
DEFEND HONG KONG'S TECHNOCORE
Mission completed! Fabu's free again!

*sniff*

Foiled again...

Aww... don't be upset! I just think that art's meant to be shared!

Do you think the Cosmic Defenders would take me back... or just forgive me... if I apologized?

Probably! But be careful now. News has it that the Dark Wizard is planning to launch a virus attack on Hong Kong!

Oh no! But if that happens, the whole digital world could be destroyed!

Fabu's right! We have to destroy the virus right away!

Hong Kong

Here it comes!

Stand back. I know kung fu!
Learn to control sprites with the mouse, program objects to bounce back, and start a game by pressing the spacebar.

Help Scratchy attack flying viruses and stop them from touching the server at the bottom of the screen. If you successfully block 30 viruses, you win the game!

First, go to the Stage and import a sparkly nighttime picture of Hong Kong!

Did you know you can add programs to the Stage, too? We can add this program to make our city glow!
We can then add a new sprite called Instructions, which tells the player how the game works. We'll write two programs for the sprite.

Program ❶ makes the sprite show up at the start of the game and disappear when the player presses space, the spacebar on their keyboard.

Program ❷ makes the Instructions sprite broadcast start when it receives the space broadcast from program ❶. This will start the game!
Then we’ll write some programs for Scratchy. Import the sprite Neo-Cat from the Super Scratch folder into your project. Notice how he already has two costumes: one where he’s just standing and another where he’s jumping.

So let’s add some programs to control how Scratchy looks. In program ❶, we hide him before the start broadcast is received. In program ❷, we control how Scratchy switches costumes. Whenever the player’s mouse is clicked—that is, whenever `mouse down?`—Scratchy looks like he’s jumping.
But how does the player control Scratchy? Program 3 lets you control Scratchy with the mouse, showing him only when the `start` broadcast is received.

Program 4 makes a speech bubble saying “OH NO!!” appear whenever the Scratchy sprite receives the `Oh` signal. We’ll broadcast `Oh` whenever a virus manages to hit the server.

Tip: By using the mouse instead of the keyboard, the player has a lot of control over Scratchy, who will move very quickly for this game. But remember—every game is different! Sometimes the keyboard works well, too.

Then we’ll draw or import a new sprite called Server. The Server has one simple program so that it appears in the right place: centered and at the bottom of the screen.
Next, import a new sprite called Virus from the Super Scratch folder. It has a set of costumes of letters spelling V-I-R-U-S.

Program ❶ hides the Virus until the game starts. Program ❷ makes the Virus switch costumes as it flies around.

Program ❸ for the Virus makes it fly around. It bounces whenever it bumps into Scratchy or the edges of the screen.
Now we’ll add more programs to the Virus to keep score. These programs use blocks from the **Control** and **Variables** palettes to record and signal the conditions for winning and losing.

Program ❹ creates a new variable called `score` and the conditions we need to meet for the script to broadcast `win`. Your score will now appear on the Stage.

Program ❼ creates a variable called `chance`, which keeps track of how many times the Virus is allowed to touch the Server sprite before the player loses. We’ll give Scratchy five chances to start. When you’re out of chances, the program broadcasts `lose`. Just like the player’s `score`, the number of tries the player has left is displayed on the Stage as `chance`.

Tip: When setting the rules for winning and losing in your games, use the greater-than symbol (>) or the less-than symbol (<) instead of the equal sign (=), as we do in programs ❹ and ❼. This will prevent the game from breaking when a variable changes too quickly!

Why might the variable change too fast in this game? Scratchy might touch the Virus a few times in quick succession, and the program won’t realize that you’ve won the game.
Now let’s add a sprite for the winning screen. Programs 1 and 2 keep it hidden. Then program 3 makes it appear when the `win` broadcast is received from the Virus sprite.

You Win!!
The city server is safe now!

The losing screen is pretty similar to the winning screen. To save time, we can select the Duplicate tool and click the winning screen to copy both the image and the programming!

You Lose!!
Press <SPACE> to try again!

All we need to do now is change the costume and the last program a bit.
We’re finished! After you save the file, hurry and help Scratchy the hacker defend the network from the virus attack!

Scratchy’s Challenge!!
How would you make this game harder for the player? How about adding different kinds of viruses? What about turning this game into a two-player Ping-Pong match? Give it a try!