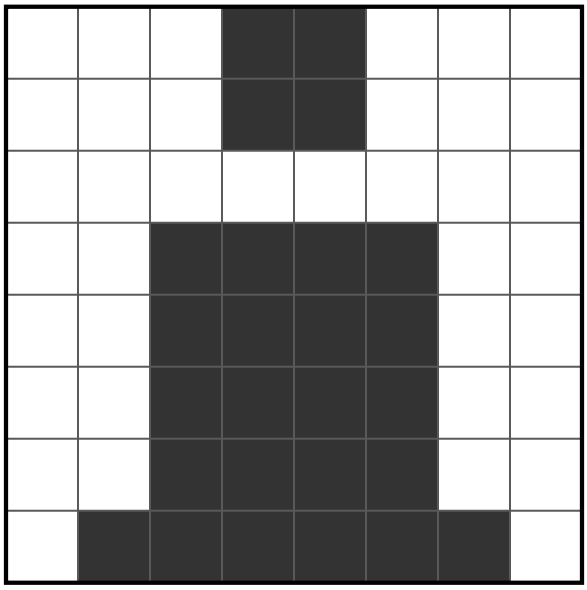
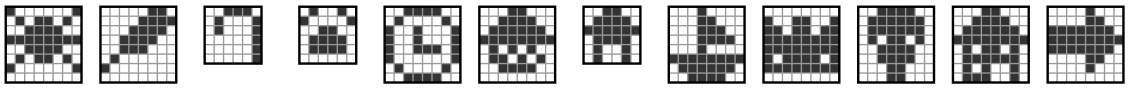
SCREEN-FREE CODING WORKBOOK • AGES 6-9

Pixel Coding for Kids Ages 6-9

70 Screen-Free Coding Activities: Color by Code, Write the Code, Robot Drawing, Bug Hunts and More, with Answers



3 white	2 black	3 white
3 white	2 black	3 white
8 white		
2 white	4 black	2 white
2 white	4 black	2 white
2 white	4 black	2 white
2 white	4 black	2 white
1 white	6 black	1 white



Harper Lane

Sample pages

Pixel Coding for Kids Ages 6-9

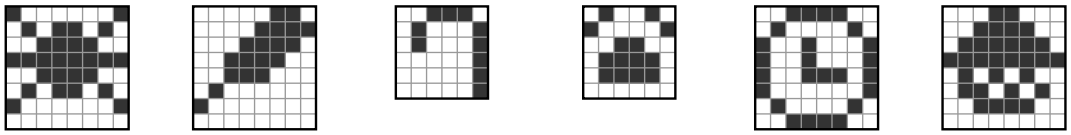
70 Screen-Free Coding Activities: Color by Code, Write the Code, Robot Drawing, Bug Hunts and More, with Answers

Copyright © 2026 Harper Lane. All rights reserved.

No part of this book may be reproduced or shared in any form without written permission from the publisher, except for brief quotations in a review. Parents and teachers may copy single activity pages for use with their own children or class.

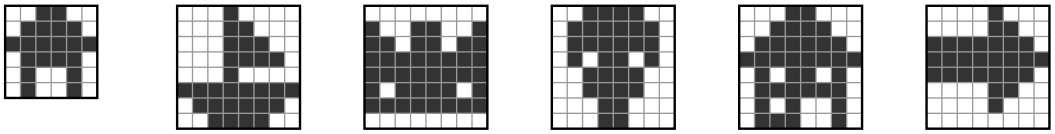
All 70 activities and their pixel pictures are original. Every code in this book was made from its picture by computer and then run again by a second, separate program to make sure it draws exactly that picture.

First edition, 2026



This book belongs to

Pixel coder in training



Contents

A Note for Grown-Ups 5

How Pixel Code Works 6

My Coder Badges 7



1. Color by Code 8
Activities 1 to 16



2. Write the Code 25
Activities 17 to 26



3. Grid Coordinates 36
Activities 27 to 36



4. Mirror Magic 47
Activities 37 to 44



5. Robot Draw 56
Activities 45 to 54



6. Squeeze the Code 67
Activities 55 to 62



7. Bug Hunt 76
Activities 63 to 70

Your Turn: Make a Code 85

Your Certificate 87

Answers 88

Sample pages

A Note for Grown-Ups

This book teaches the first big ideas of coding with nothing but a pencil and crayons. A **pixel** is one square of a picture, and **code** is a list of exact instructions. In 70 activities your child reads code to make pictures, writes code for pictures, and fixes code that has bugs, just like a programmer does.

What your child practices

- **Following an algorithm**: reading code step by step, in order, to make a picture (Color by Code).
- **Encoding**: turning a picture into code, the way a computer stores images (Write the Code).
- **Coordinates**: finding a square by its column letter and row number (Grid Coordinates).
- **Symmetry**: finishing a picture that is the same on both sides of a mirror line (Mirror Magic).
- **Sequencing and loops**: following a robot's program of moves and turns, with repeat blocks (Robot Draw).
- **Compression**: making code shorter by writing repeated rows only once (Squeeze the Code).
- **Debugging**: comparing code with its picture to find and fix the bugs (Bug Hunt).

How the book works

There are **7 chapters**. Each one starts with a page that explains the new idea with a worked example, and the activities inside each chapter get a little harder as they go (one to three stars). The answers start on page **88**.

Every code was checked twice

Every code in this book was made from its picture by computer, and a second, separate program ran each printed code again to make sure it draws exactly that picture. A row of code always adds up to the width of the grid, so your child can check their own counting.

Tips for helping

- Use a pencil for the first try and crayons once the picture appears. The black squares can be colored with a pencil or a black crayon.
- Read the first page of each chapter together. Point at the squares while you count out loud.
- Mistakes are part of coding. Programmers call them **bugs** and finding them is half the fun.
- The certificate on page 87 is waiting at the end.

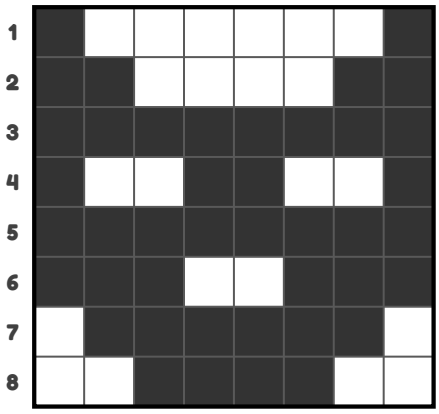
Sample pages

How Pixel Code Works

Pixels. Every picture on a screen is made of tiny squares called **pixels**. In this book, each square of a grid is one pixel.

Code. A code is a list of exact steps. A computer follows it one step at a time, in order, and never guesses. In this book, YOU are the computer!

Reading order. Read a code like a book: each row from **left to right**, and the rows from **top to bottom**. The code **8 black** is row 3 of this picture.



How to read a code chip



The big number says **how many** squares, the word says **which color**. These three chips say: 2 white squares, then 4 black squares, then 2 white squares.

Your crayons

Some pictures use the eight colors of a basic crayon box. Color each circle with its crayon now, so you can check it later. In the answers, each color is shown by its letter.

(R) **red** (O) **orange** (Y) **yellow** (G) **green**

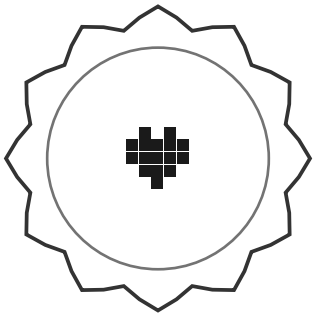
(B) **blue** (P) **purple** (N) **brown** (K) **black**

Coder tip: every row of a code adds up to the width of the grid. If a row of 8 squares has the code 2, 4, 2, check: 2 + 4 + 2 = 8. If your numbers do not add up, there is a bug to fix!

Sample pages

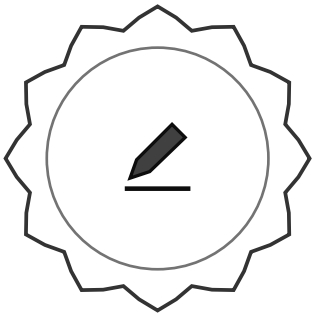
My Coder Badges

Finish a chapter, then color its badge. Collect them all to earn your certificate!



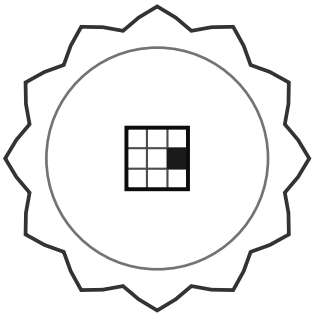
Chapter 1

Color by Code



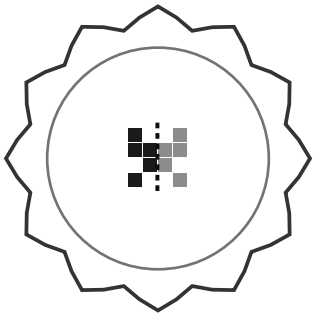
Chapter 2

Write the Code



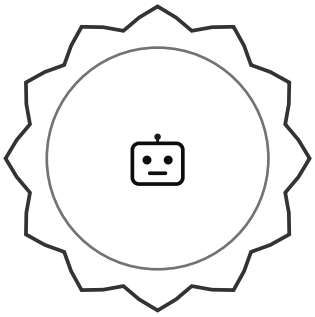
Chapter 3

Grid Coordinates



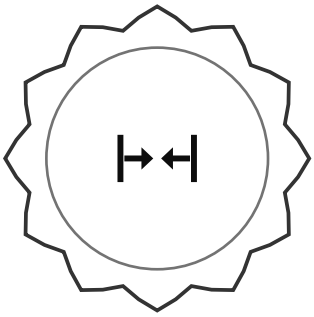
Chapter 4

Mirror Magic



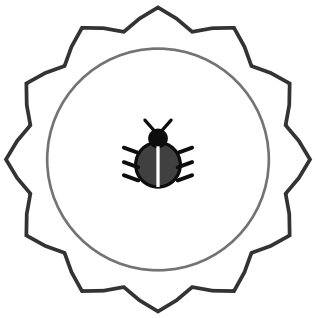
Chapter 5

Robot Draw



Chapter 6

Squeeze the Code



Chapter 7

Bug Hunt

Sample pages

CHAPTER 1

Color by Code

Activities 1 to 16

Computers keep pictures as code. Now you get to turn code back into a picture!

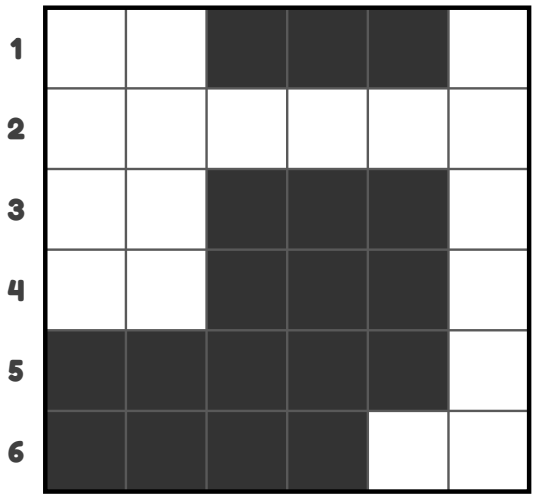
1. Start at row 1. Read the chips from **left to right**.
2. Each chip says **how many** squares and **which color**.
3. Color the squares, then go on to the next row.

Worked Example

The code

Row 1	2 white	3 black	1 white
Row 2	6 white		
Row 3	2 white	3 black	1 white
Row 4	2 white	3 black	1 white
Row 5	5 black	1 white	
Row 6	4 black	2 white	

The picture it makes



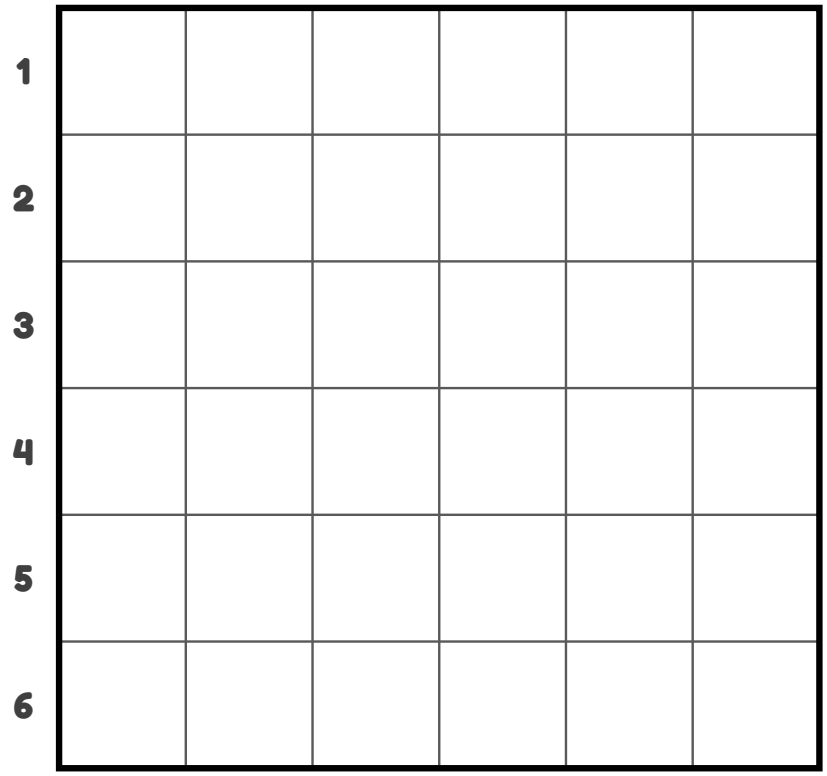
Tip: Count with your finger on the squares. Each row adds up to the width of the grid.

Sample pages

Color by Code

★☆☆ **No. 1**

Read the code for each row, from left to right. **6 white** means leave 6 squares white. **2 black** means color 2 squares black. What picture appears?



6 white		
2 white	2 black	2 white
5 black	1 white	
6 black		
1 white	4 black	1 white
6 white		

It is a _____

Did you know? Computers keep colors as numbers. Your crayons have names, and a computer gives every color a number code!

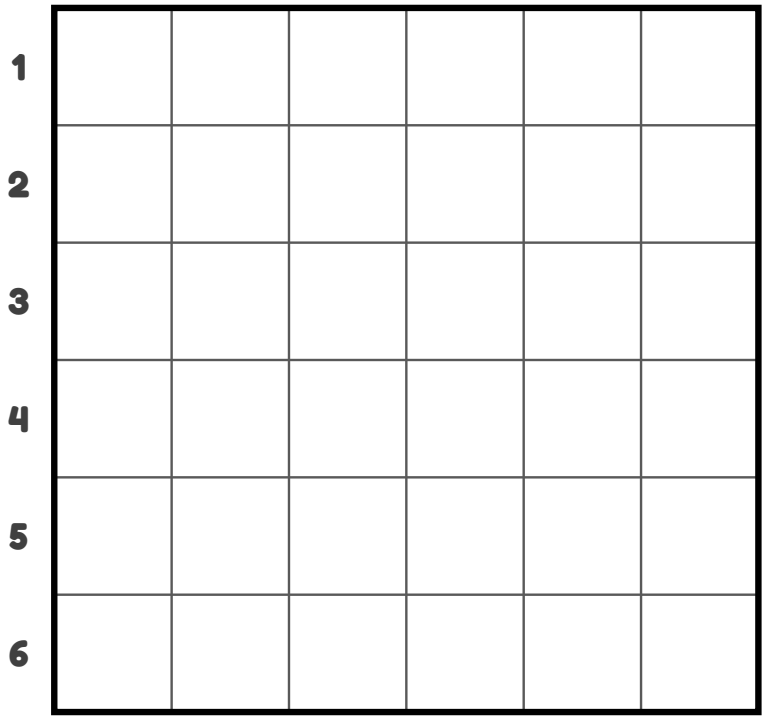
☆ Color the star when you finish!

Sample pages

Color by Code

★☆☆ **No. 2**

Read the code for each row, from left to right. **4 white** means leave 4 squares white. **1 black** means color 1 squares black. What picture appears?



1	1 black, 4 white, 1 black
2	2 black, 2 white, 2 black
3	6 black
4	1 black, 1 white, 2 black, 1 white, 1 black
5	6 black
6	1 white, 4 black, 1 white

It is a _____

Did you know? Programmers check their code by running it, the same way you check a code by coloring it.

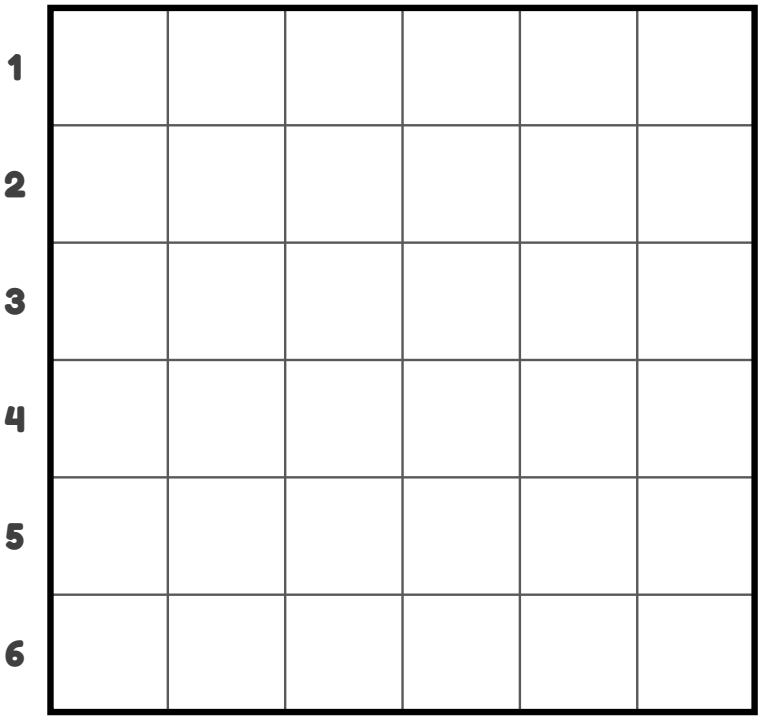
☆ Color the star when you finish!

Sample pages

Color by Code

★☆☆ **No. 3**

Read the code for each row, from left to right. **1 white** means leave 1 squares white. **1 black** means color 1 squares black. What picture appears?



1 black	1 white	2 black	1 white	1 black	
6 black					
1 white	4 black	1 white			
2 white	2 black	2 white			
1 black	1 white	2 black	1 white	1 black	
1 white	4 black	1 white			

It is a _____

Did you know? Writing "4 black" instead of "black, black, black, black" is a real trick computers use to make picture files smaller.

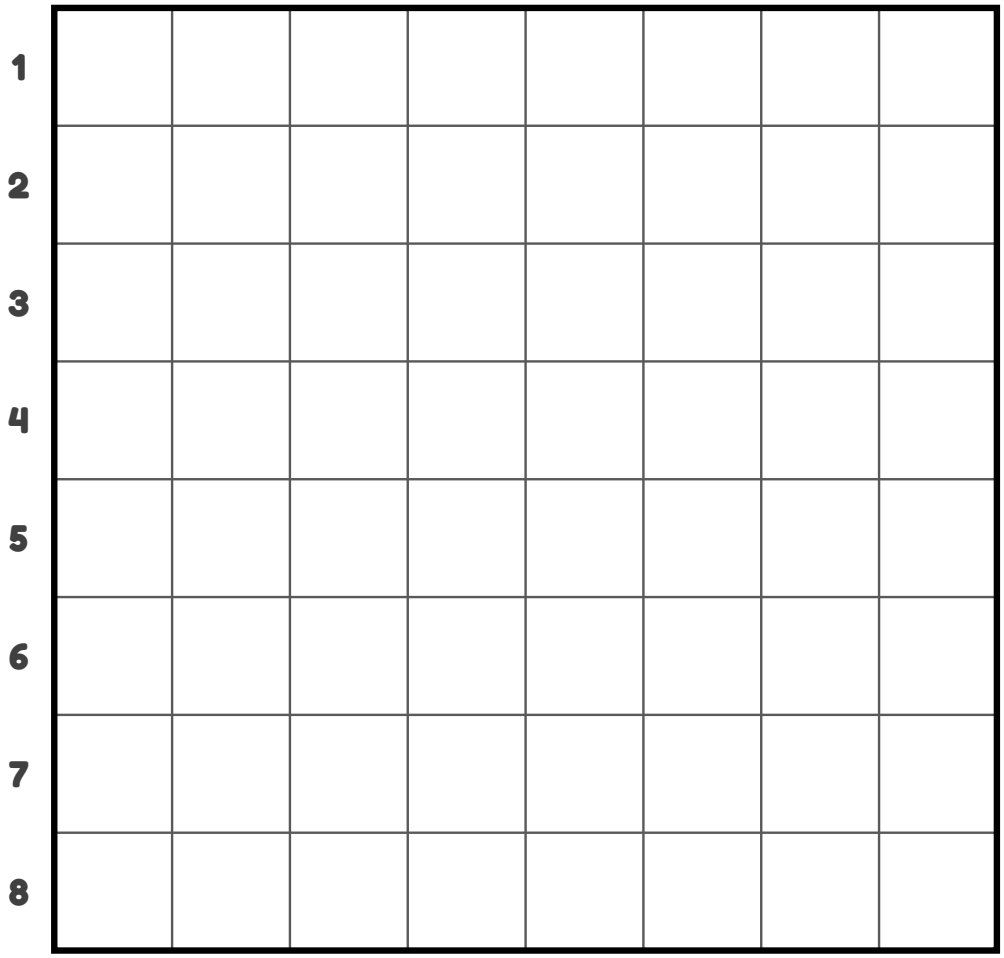
☆ Color the star when you finish!

Sample pages

Color by Code

★☆☆ **No. 4**

Read the code for each row, from left to right. **2 white** means leave 2 squares white. **4 black** means color 4 squares black. What picture appears?



2 white	4 black	2 white	
1 white	6 black	1 white	
8 white			
1 white	6 black	1 white	
1 white	6 black	1 white	
8 white			
1 white	6 black	1 white	
2 white	4 black	2 white	

It is a _____

Did you know? Every square of a grid has an address, like A1 or C4. Spreadsheets on computers use the same idea.

☆ Color the star when you finish!

Sample pages