Here's a Java program that demonstrates all the different ways to declare and define arrays in one place:

public class ArrayExample {

public static void main(String[] args) {

// 1. Declaration and Initialization Separately

int[] numbers;

numbers = new int[5]; // Default values are 0

// 2. Declaration and Definition Together

int[] numbers2 = new int[5];

// 3. Declaration with Direct Initialization

int[] numbers3 = {1, 2, 3, 4, 5};

// 4. Using `new` Keyword with Initialization

int[] numbers4 = new int[]{10, 20, 30, 40, 50};

// 5. Multi-dimensional Array (3x3 Matrix)

int[][] matrix = new int[3][3];

// 6. Multi-dimensional Array with Initialization

int[][] matrix2 = {

{1, 2, 3},

{4, 5, 6},

{7, 8, 9}

};

// 7. Array of Strings (Array of Objects)

String[] names = new String[]{"Alice", "Bob", "Charlie"};

// Printing the arrays to show their values

System.out.println("numbers3 array: ");

for (int num : numbers3) {

System.out.print(num + " ");

}

System.out.println(); // New line

System.out.println("numbers4 array: ");

for (int num : numbers4) {

System.out.print(num + " ");

}

System.out.println(); // New line

System.out.println("matrix2 (2D array): ");

for (int i = 0; i < matrix2.length; i++) {

for (int j = 0; j < matrix2[i].length; j++) {

System.out.print(matrix2[i][j] + " ");

}

System.out.println();

}

System.out.println("names array: ");

for (String name : names) {

System.out.print(name + " ");

}

}

}

**Explanation:**

* Declares and initializes different types of arrays.
* Uses loops to print 1D and 2D arrays.
* Demonstrates the use of the for-each loop for arrays.

This should give you a complete understanding of arrays in Java.