Lesson Plan

Lesson 1.1: Neural Networks
Lesson 1.2: Image Recognition Training
Lesson 2.1: Programming Fundamentals
Lesson 2.2: Conditional Programming
Lesson 2.3: Loops
Lesson 2.4: Functional Programming
Lesson 3.1: Basic and Advance Training
Lesson 3.2: AI Interfacing
Lesson 3.3: Autonomous Systems
Lesson 4 : Debugging your code

Lesson 2.1 Programming fundamentals

Warm-up (10 mins)
Main Activity (10 mins)
Wrap up (05 mins)
Extras

Prerequisites:

In our previous chapters we discussed what is a neural network and also introduced our students to image recognition as well. If you haven't already, go back to pages 3 & 6 of this book.

Lesson Overview:

In this chapter, students will understand what is programming languages and how we use them to train a computer or give them instructions to execute.

Lesson objective:

1. Students should understand how computers execute commands given to them.
2. Each player reviews their code cards and the sequence of their programming code.
3. Ask the students to write the algorithm of the game played on a sheet.

Requirements:

1. CoderMindz game board
2. Decks of Coder Mindz Code cards

Getting started:

1. We'll be playing Bot Movements => Basic Code Cards from our rule book which covers rules and programming concepts.
2. Instructors will explain the chapter titled 'Basic Code Cards' in Section 2 of the rule book and students will do the exercise.
3. After the rule book is explained, arrange the cards and the board. After the initial setup, explain cards, movements of the bot, choose starting position and get ready to start the game.

Programming Languages:

Computers are everywhere. A computer is a machine that follows a set of instructions to do some tasks. A collection of instructions is called a program or code. These programs or codes are written in a programming language which is converted into a machine-readable language (binary code). Today we can do anything that we dream of with a computer. They have become more powerful, smarter, compact and more efficient over the years. And due to their reducing sizes, we're able to carry them in our pockets.

Some examples of widely used programming languages:

- Python
- C++
- Java
- JavaScript
- PHP

As we studied, computers are good at following instructions. Some examples of instructions are mathematical operators like add, subtract, division and multiplication. These are nothing but functions that take parameters. We'll discuss the conditional programming and functions in the subsequent chapters.

Programming Instructions:

When you associate a variable name with a value, it becomes an instruction that the programming compiler has to follow.

For example: Consider we want to find the area of a rectangle whose length and Width is known. We associate the values of these parameters with variable which is stored in the computer's memory.

Length = 30 cm
Width = 20 cm

Rectangle = Length x Width

Output: 30 x 20 = 600 sq. cm

Here 'Length' and 'Width' are the variables and 'Rectangle' is an instruction.

Board Activity:

1. Explain students about instruction cards from the game like ***Move Forward***, ***Move Right***, ***Move Left***, ***Move Any 1***, ***Move Any 2***, and ***ZAP*** cards which together form the deck of basic cards in our game.

2. Clear all doubts and move on to the next chapter on programming concepts.

