

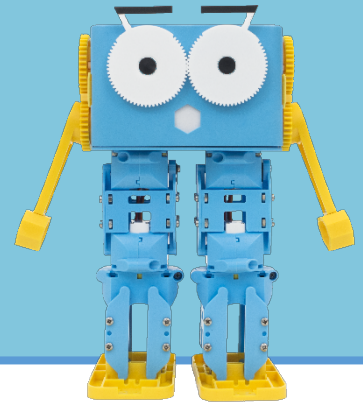
Lesson 1.7 – Parallel Programming

Education Level: Second Level (Age 7-11)

Lesson Duration: 45 minutes

Prerequisite Knowledge: Lessons 1.1-1.6

Device Compatibility: Laptop, PC or Tablet



Lesson Overview

This lesson will be a basic introduction to parallel programming where students will think about how they can go about getting Marty to do two things at the same time rather than one after the other. First, this will be demonstrated in Scratch before trying it out with Marty.

Learning Objectives

- Understand the difference between running two commands at the same time versus one after the other
- Create a small program that makes use of parallel programming using Scratch
- Understand when parallel programming should be used

Key Vocabulary

- Code blocks
- Parallel
- Sequence
- Programming

Resources & Equipment

- Marty the Robot
- Marty Workbook (Lesson 3)
- Laptops/Computers/Tablets
- Access to the Scratch editor

Additional Reading

- Educator's Guide
- Introduction to Programming with Marty using Scratch

Learning Plan & Activities

1. Discussion of how we can do two things at once sometimes, for example, lift both of our arms at the same time
2. As a class activity, using Scratch, program the Scratch cat to move 20 steps and say *Hello*
 - a. What do students notice about the order in which the cat does this? Does it move and speak at the same time? Or one after the other?
3. Discuss how students think that we would program Scratch cat to do this action at the same time by introducing the concept of parallel programming (doing multiple things at once)
4. Show the students how they could achieve getting the cat to move and talk at the same time
 - a. Get them to give it a shot on Scratch and see what other things they can program the cat to do at the same time
5. Now move on to thinking about Marty's movements
 - a. Can we program Marty to do more than one move at a time? Any move or only certain ones?
 - b. Try and do these moves themselves (for example, do students think that they could lean to their left, put all their weight there and still kick their left foot?), highlighting limits of when we can use parallel programming
6. Ask students to try and experiment with parallel programming Marty, first of all by programming Marty to lift both arms up

Additional Challenges

- Get students to experiment with Scratch and see if they can program Scratch cat or Marty to do 3 things at once

Curriculum Benchmarks

Curriculum for Excellence – Technologies Benchmark Guide

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

| Curriculum Organiser | Benchmark Covered | Lesson 1.7 |
|---|-------------------|------------|
| Digital Literacy | TCH 0-01a | ● |
| Craft, Design, Engineering and Graphics | TCH 0-11a | ● |
| | TCH 1-11a | ● |
| | TCH 1-12a | ○ |
| | TCH 3-12a | ○ |
| Computing Science | TCH 0-13a | ● |
| | TCH 1-13a | ○ |
| | TCH 2-13a | ○ |
| | TCH 3-13a | ● |
| | TCH 0-14a | ● |
| | TCH 0-14b | ● |
| | TCH 1-14a | ● |
| | TCH 1-14b | ● |
| | TCH 2-14a | ○ |
| | TCH 3-14a | ○ |
| | TCH 0-15a | ● |
| | TCH 1-15a | ● |
| | TCH 2-15a | ○ |

National Curriculum – Computing, Design & Technology

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

| Curriculum Organiser | Benchmark Covered | Lesson 1.7 |
|----------------------|---------------------|------------|
| Computing | 1-a | ● |
| | 1-b | ● |
| | 1-c | ● |
| | 1-e | ● |
| | 2-a | ● |
| | 2-b | ● |
| | 2-c | ● |
| | 3-a | ● |
| | 3-b | ● |
| | 3-d | ○ |
| | 3-e | ● |
| | 4-a | ○ |
| | 4-b | ○ |
| | Design & Technology | 1.1-b |