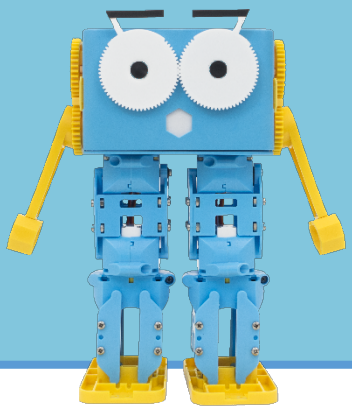
Lesson 1.15 – Bump Switches

Education Level: Second Level (Age 7-11)
Lesson Duration: 45 minutes

Prerequisite Knowledge: Lessons 1.1-1.14
Device Compatibility: Laptop, PC or Tablet



Lesson Overview
So far, students have had to test out the number of steps that it will take Marty to walk a certain distance to program him to do things like obstacle courses. By attaching bump switches to Marty then we can add a sense of touch to help make decisions. In this lesson, students will explore how we can use bump switches and consider the different body parts that we can attach them to.

Learning Objectives
- Describe bump switches to add a sense of touch to help Marty make decisions like when to stop walking
- Program Marty to respond to an obstacle in front of him and stop walking
- Test out the different body parts that we can put bump switches onto and what they can help us decide or look out for

Key Vocabulary
- Bump switches
- Switch
- Touch
- Sense
- Programming
- Repeat until or conditional loops

Resources & Equipment
- Marty the Robot with bump switches attached
- Marty Workbook (Lesson 1)
- Laptops/Computers/Tablets
- Access to the Scratch editor
- Objects to use as obstacles

Additional Reading
- Educator's Guide
- Introduction to Programming with Marty using Scratch
- Bump Switches: Give Marty a Sense of Touch (Blog Article)

Learning Plan & Activities
1. Recap of the different concepts that has been covered so far in previous lesson packs
2. Present problem of how do I know how many steps Marty has to take to get to a certain spot/object?
    a. Previously we had to manually walk him through the distance and count the steps to get a rough idea
3. Ask students how they decide when they have reached the spot or when there is an obstacle in their way (imagining if they are blindfolded)
4. We can add a sense of touch to Marty by adding bump switches
    a. How the switch works
    b. What do students then think we can use the switches for?
5. Programming task in small groups to get Marty to keep walking forward until he comes across an obstacle in his way, then he should stop walking and show his angry eyes
6. Card game in the same small groups to start thinking about where else we could attach the bump switches
    a. Try matching the cards first by guessing what they think will happen

b. Test it out and check what they thought would originally happen

c. Write up in workbook

Additional Challenges

- Come up with other areas or uses for the bump switch, test it out and get other students to guess what the switch could detect based on where it is
- Students plan how they would use bump switches on front, left and right of feet (4 switches in total) to help solve a small maze
- Program Marty to solve a small maze that has been built

Curriculum Benchmarks

Curriculum for Excellence – Technologies Benchmark Guide

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	Lesson 1.15
Digital Literacy	TCH 0-01a	●
Technological Developments in Society & Business	TCH 0-05a	●
	TCH 2-05a	○
	TCH 0-11a	●
Computing Science	TCH 0-13a	●
	TCH 1-13a	●
	TCH 2-13a	●
	TCH 3-13a	●
	TCH 3-13b	●
	TCH 4-13a	○
	TCH 0-14a	●
	TCH 0-14b	●
	TCH 1-14a	●
	TCH 1-14b	●
	TCH 2-14a	●
	TCH 2-14b	○
	TCH 3-14a	●
	TCH 0-15a	●
	TCH 1-15a	●
	TCH 2-15a	●
	TCH 3-15a	○
	TCH 4-15a	○

National Curriculum – Computing, Design & Technology

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	Lesson 1.15
Computing	1-a	●
	1-b	●
	1-c	●

	1-e	●
	2-a	●
	2-b	●
	2-c	●
	2-e	●
	2-f	○
	3-a	●
	3-b	○
	3-d	○
	4-a	○
	4-b	○
Design & Technology	1.1-b	●
	1.3-b	●
	2.3-b	●

Australian F-10 Curriculum – Digital Technologies, Design & Technologies

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	Lesson 1.15
Digital Technologies	ACTDIK001	●
	ACTDIK002	●
	ACTDIP003	○
	ACTDIP004	●
	ACTDIK008	●
	ACTDIP010	●
	ACTDIP011	●
	ACTDIP013	●
	ACTDIP019	●
	ACTDIP020	○
	ACTDIP029	○
	ACTDIP040	○
Design & Technology	ACTDEP006	●
	ACTDEP009	●
	ACTDEP018	○