CHRISTMAS-4

MARTY CHRISTMAS ORCHESTRA

Outcomes, Resources & Learning Plans

EDUCATION LEVEL: Second/Third Level (Ages 8-13) **PRE-REQUISITES:** N/A
LESSON DURATION: 90 minutes **DEVICE COMPATIBILITY:** Laptop, PC or Tablet
CROSS-CURRICULAR LINKS: Technologies/Music/Arts/Numeracy

LESSON OVERVIEW

Create or grab some musical instruments and code Marty to play your favourite Christmas carols by breaking down these classic songs into sections that can be played by each student group. Build up your musical robot group by adding more instruments!

LEARNING OBJECTIVES

- Breakdown classic Christmas songs and consider where repetition happens
- Code a sequence of different musical notes in time with the song

KEY VOCABULARY

- Music
- Notes
- Sequence
- Instrument
- Repetition

RESOURCES & EQUIPMENT

- Marty the Robots (number will depend on songs and instruments being used)
- Access to compatible devices connected to Marty on Scratch/Python
- Instruments for Marty to play (e.g. bells)

ADDITIONAL READING

- Marty the Robot Educator Guide
- Educator FAQ
- Example of our Marty orchestra using bells

LEARNING PLAN & ACTIVITIES

1. Class discussion of what an orchestra is and the different roles played within one
2. With the selected set of instruments, break students into groups to explore how they can code Marty to play the instruments
3. Student groups should research different Christmas songs that they could code Marty to play with the instruments by analysing the musical notes required to play each song and checking if they could replicate this with their class set-up
4. Either working as a class or small groups (depending on how many Marty's and instruments you have) begin to sequence the different notes that need to be played and code them to happen in time one after the other
5. Encouraging students to make small changes and frequently testing their programs and set aside some time at the end of the lesson to demonstrate the full song from the whole class/different groups

EXTENSIONS & CHALLENGES

- What other songs could students recreate with this setup? (*Music/Technologies/Numeracy*)
- What other instruments could be added to the setup? Drums? Boomwhackers? *(Music/Technologies/Numeracy)*
- Include *functions* into the program to play different repeating sections of a song *(Music/Technologies)*

LINKS TO THE CURRICULUM

Support with Benchmarks & Frameworks

Curriculum for Excellence - Technologies

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	CHRISTMAS-4
Digital Literacy	TCH 0-01a	●
	TCH 1-01a	●
	TCH 0-02a	●
	TCH 1-02a	●
	TCH 2-02a	●
Craft, Design, Engineering and Graphics	TCH 0-09a	○
	TCH 1-09a	○
	TCH 2-09a	○
	TCH 3-09a	○
	TCH 0-12a	●
	TCH 1-12a	●
	TCH 2-12a	●
	TCH 3-12a	○
Computing Science	TCH 0-13a	●
	TCH 1-13a	●
	TCH 2-13a	●
	TCH 3-13a	●
	TCH 3-13b	○
	TCH 0-14a	●
	TCH 1-14a	●
	TCH 2-14a	●
	TCH 0-14b	●

LINKS TO THE CURRICULUM

Support with Benchmarks & Frameworks

Curriculum for Excellence Continued...

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	CHRISTMAS-4
Computing Science	TCH 3-14b	○
	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	CHRISTMAS-4
Computing	1-a	●
	1-b	●
	1-c	●
	2-a	●
	2-b	○
	2-c	●
	2-f	○
	3-a	●
	3-c	○
	3-g	●
	4-a	○
	4-b	○

LINKS TO THE CURRICULUM

Support with Benchmarks & Frameworks

National Curriculum Continued...

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	CHRISTMAS-4
Design & Technology	1.1-a	●
	1.2-b	●
	2.2-b	○
	2.3-b	●
	3.1-b	●
	3.3-c	●

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

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	CHRISTMAS-4
Digital Technologies	ACTDIK001	●
	ACTDIP004	●
	ACTDIP006	●
	ACTDIP010	●
	ACTDIP011	●
	ACTDIP013	●
	ACTDIP017	○
	ACTDIP019	○
	ACTDIP020	○
	ACTDIP022	●
	ACTDIP030	○

LINKS TO THE CURRICULUM

Support with Benchmarks & Frameworks

Australian F-10 Curriculum Continued...

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	CHRISTMAS-4
Design & Technologies	ACTDEK002	●
	ACTDEK004	○
	ACTDEP005	●
	ACTDEP006	○
	ACTDEP007	●
	ACTDEP008	●
	ACTDEP009	●
	ACTDEK011	●
	ACTDEK013	●
	ACTDEP014	●
	ACTDEP015	○
	ACTDEP016	●
	ACTDEP017	○
	ACTDEK023	●
	ACTDEP024	●
	ACTDEK031	○
	ACTDEP035	●
	ACTDEK043	○

LINKS TO THE CURRICULUM

Support with Benchmarks & Frameworks

CSTA K-12 - Computer Science

● = Fully Addresses Benchmark ○ = Partially Addresses Benchmark

Curriculum Organiser	Benchmark Covered	CHRISTMAS-4
Computing Systems	1A-CS-01	●
	1A-CS-02	●
	1B-CS-01	●
	1B-CS-02	●
	1B-CS-03	○
	2-CS-02	○
Algorithms & Programming	1A-AP-08	●
	1A-AP-10	○
	1A-AP-11	●
	1A-AP-12	●
	1A-AP-14	○
	1B-AP-10	○
	1B-AP-11	●
	1B-AP-13	●
	1B-AP-15	●
	2-AP-12	○
	2-AP-15	●

DISCUSSION PROMPTS & GUIDES

Prompts & Questions for Delivery of Lessons

MARTY CHRISTMAS ORCHESTRA

WHAT IS AN ORCHESTRA?

During this lesson, students will be creating their own mini orchestra that they will be leading by coding different Martys to play musical notes at different intervals.

- What is an orchestra?
- How many people do you think are in an orchestra?
- What instruments do you think they will play?
- What instruments do you think Marty will be able to play?

SETTING MARTY UP TO PLAY INSTRUMENTS

Marty has different *body parts* that could be used to play different parts of instruments but students will need to consider how much *force* is required before any sound comes from the chosen instruments.

- What instruments do you think Marty could play?
- What parts of Marty could you use to play an instrument?
- How fast will Marty need to move to generate enough *force* to make sounds?
- How many Marty's do you think you will need to play a song? Will 2 be enough for every song?

BREAKING DOWN SONGS

Songs are generally made up of verses and choruses. You might want for students to highlight where in their chosen song there is repetition. This may help students when designing their programs.

- What sections typically make up a song?
- Do you think there are any parts of the song that get repeated? Where?
- How will you deal with this repetition in your programs?

SOLUTIONS

Sample Solutions & Activity Guides

1 Playing a song with your Martys

There is no right or wrong way to create a program to play a song with instruments using a group of Martys. This activity can be done using either Scratch or Python so if you have some students who are looking to practice Python some more then this would be a good opportunity for this.

Here are some things to look out for,

INSTRUMENT SELECTION

- How is Marty going to play this instrument? Which body parts will need to move?
- How much force will be required to generate sound from the instrument?
- Will this instrument be enough to play a whole song on? Can it play enough different musical notes?

SONG SELECTION

- How many different musical notes are in this song? Will your selected instrument be able to cater for those different notes?
- How long is the song? Will students be able to complete this full song within the lesson?