

Marty Teacher Guide – Lesson 3.1

Third/Fourth Level

DRAWING A ROBOT ALGORITHM

A good warm-up activity to get students to start to think in the mindset of a roboticist and programmer is getting them to write out some instructions for someone to draw a robot. By doing this, students will get a feel for not only testing and debugging their instructions but how detailed we sometimes have to be when giving instructions to computers and people.

- After testing the instructions with a partner
 - Did your partner draw your robot the way you imagined?
 - What was different? Why was it different?
 - Was there any way you could have stopped this from happening?
 - How would you make your instructions easier to follow so that your partner could reproduce a drawing of a robot more similar to the one you had imagined?

WHAT CAN MARTY DO?

In order to first start to consider what features and functionalities Marty has, it might be worth considering what a robot is in general initially. Following on from that, students can start to think about what robots they have heard of and what kind of things they do before drawing links between those robots and our robot, Marty.

- What is a robot?
- Is a printer/washing machine a robot?
- Can you think of any robots that you have heard of or seen before?
- What can these robots do?
- What kinds of places do these robots work in?
- Is there anything we mentioned that a robot can do that you think Marty might be able to do?
- What else do you think Marty can do? Why? What body parts will be needed to complete that action?

MARTYPY

The Python library that is used to program Marty is called *MartyPy*. The library as well as getting started guides can be found online,

<https://martytherobot.com/users/using-marty/program/python/>

This is what students will be using and referring to when they are programming Marty. It is important to start off small by considering individual commands first before then stringing on multiple commands and asking students to predict the outcome.

- Showing individual commands – what do you think this will do?
- Where in the documentation will I find commands that will help me to program Marty to walk forwards 2 steps?

Marty Teacher Guide – Lesson 3.2

Third/Fourth Level

USING DOCUMENTATION WHILST PROGRAMMING

All products have instruction manuals and programming languages and libraries should be no different. When using a new language or library, like *MartyPy*, it is really important to read through the available documentation and keep it at hand for when programming and experimenting with it.

- Why do we need documentation?
- How can I find out how to program Marty to walk? Move his arms? Eyes? ...
- Is the documentation easy to use? What's difficult? How could we make it better?

CREATING YOUR OWN MARTYPY HANDBOOK

We're going to practice writing and presenting our own documentation by creating a MartyPy handbook. This will allow students to explore the different commands that can be used with the library and share with their peers/other classes how it works.

- How would you explain what this method does to your friends?
- How would you explain how to use it? Pictures? Videos? Example code?
- What layout are you going to use?

MAKING GOOD DOCUMENTATION

Making good documentation is difficult. This is why it's important to test it out with other people who know the library but also with people who don't. During the lesson, students will get their classmates to test out/give feedback on their handbooks. It might help for students to think of the following,

- Is there any information missing?
- What would help to explain this method better?
- Do the example programs work? Are these what you would expect from the description?

Marty Teacher Guide – Lesson 3.3

Third/Fourth Level

WHY SCRIPTS?

Up until now, students have been using the Python shell to write commands and run them straight away so that they can test out the different things that Marty can do. However, they will start to realise that it might be useful to have a file for the program to be stored in so that it's easy to make changes and run everything at once without typing every command one after the other.

- Don't forget to save your scripts somewhere sensible and give them a meaningful name
- Run your programs regularly to test them out

DANCE-OFF

Students should start to piece together their movement commands so that we start to get a sequence of moves. A song should be agreed by the whole class/group. Students should be prompted to use their handbooks also when exploring and developing.

- How many different body parts can you program to move in your dance move?
- Can you get Marty to move in time with the music?

Marty Teacher Guide – Lesson 3.4

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PLANNING THE MUSIC VIDEO

Students should break into small groups and begin to prepare and plan their music video that they will be creating and recording using Marty the Robot.

- What song are you going to use?
- Who is going to be in charge of choreography and backgrounds/scenery?
- What backgrounds and props would go with the chosen song?
- What dance moves are you going to include in the routine?

SHOOTING A MUSIC VIDEO

Students will spend most of the lesson putting together and perfecting their dance routine. However, once it is ready, they will need to record Marty dancing with the backgrounds and props that they have created/gathered for the video.

- Remind students how long they have left to record their music video
- If you want to extend this lesson further, students could spend some time editing their videos and adding some special effects