



TITLE: Codey Rocky meets Functions

LEARNING SCENARIO

School:	Duration (minutes):	90
Teacher:	Students age:	10+

Essential Idea:	Create a function and call the function in the code to give Codey a custom boot animation.
------------------------	---

Topics:

- designing, creating and writing in a visual programming language: ideas, stories and solutions to problems of varied complexity
- experimenting with AI
- civilization related implications of AI

Aims:

- to understand the two concepts: conditional and boolean
- use the conditional blocks to complete tasks
- identify the color sensor, light sensor and the IR proximity sensor

Outcomes:

- design, create and test simple program in a graphic environment to create animations

Work forms:

- individual work, work in pairs, group work

Methods:

- presentation, talk, discussion, interactive exercise

ARTICULATION

The course of action (duration, minutes)

INTRODUCTION



ARTIE: Artificial Intelligence in Education - challenges and opportunities of the new era:
development of a new curriculum, guide for educators and online course for students
Project co-funded by European Union under Erasmus+ Programme, 2020-1-HR01-KA201-077800

The teacher starts a discussion:

Washing hair requires three steps: shampoo your hair, massage hair to form foam and rinse the foam off. But if we don't use the phrase "wash hair" to describe the set of steps, what will be the situation then? In everyday life, we often give a set of actions a single name and use the name to refer to the whole set of actions when necessary.

After we name the set of actions as "wash hair", the situation will be like this:

When your friends are asking you out, you will say, "I'm going to wash hair. Wait."

Use a simple phrase to name the set of actions. The name is what we call a function.

In programming, we use a function to name a set of instructions and call the function in the code if necessary.

The first thing to create a function is to give the function a name. Next, you need to define the function by adding instructions.

Announcement of the goal of the lesson:

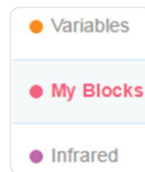
The goal of this lesson is to understand the functions, to define the function by adding instructions.

MAIN PART

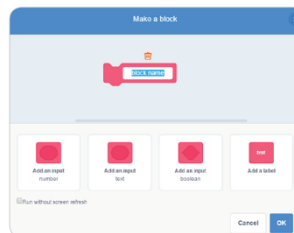
Create a startup function for Codey Rocky, making sure the function will automatically run when Codey Rocky starts up.

Open the mBlock 5 and connect Codey to the software. Follow the instructions to complete the challenge.

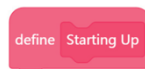
Click My Blocks at the category bar and select Make a Block.



Then, the "define" starting up block will appear in the Scripts area.



What instructions should be run when Codey Rocky starts up? Design programs under the defined starting up block.



After defining the function, you can directly call the function by adding the starting up block to the bottom of the event block when Codey Rocky starts up.



when Codey starts up

Starting Up

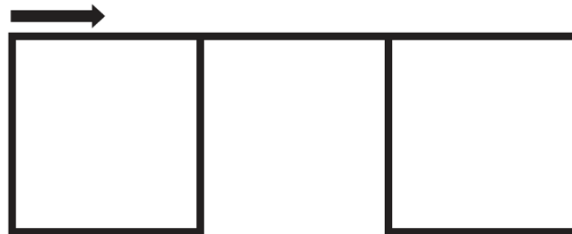
Improve on the sample project. You can change the animation or the sound.

Select an image from the built-in images and refine the image as you would like. Then create your animation using the image.

Task 2:

Imagine Codey Rocky is a security guard. It is patrolling the passages in the building to make sure that all the properties are safe. Now, it's patrolling on the 1st floor.

Design programs to make Codey Rocky follow the black lines as shown below.



Create a function and name it Square.



You might need to use the following blocks.



Figure out how much time it takes Codey Rocky to drive along the square-shaped line and the linking line.

- Measure the length of one side of the square.
- Measure the length of the linking line.
- Calculate how much time it takes Codey Rocky to drive along a square.
- Calculate how much time it takes Codey Rocky to drive along the linking line.
- Calculate the speed of Codey Rocky (per second). (For instance, if Codey Rocky is programmed to keep moving forward at a power of 50% for 1 second, what is the driving distance then?)

Call the function Square two times under the event block when button "A" is pressed.

Notes

- The first step is to measure the length and width of the roadmap. Based on the measurements, you need to figure out how much time it takes Codey Rocky to complete the route.



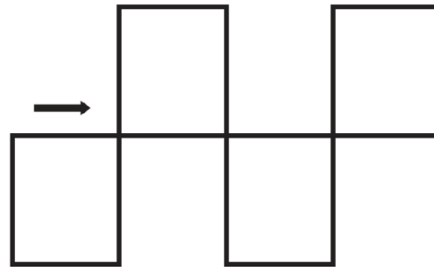


- The motor of Codey Rocky is a DC motor so Codey Rocky is not able to make turns or follow lines precisely. In this case, it's fine that Codey Rocky roughly follows the line.
- Codey Rocky is programmed to move forward and turn right. After Codey Rocky repeats the behaviors four times, it will go back to the starting position.
- Since there are two squares in the roadmap, you are supposed to call the function Square at least twice in the code.

Students can show some well-done projects. When sharing the projects, students are supposed to give their answers to the questions proposed by others.

Task 3:

Codey Rocky comes to the 2nd floor. There are more rooms and the route is more complex. Design programs to make Codey Rocky drive along the black line as shown below.



You need to create two functions, Upper square and Bottom square.

Figure out how much time it takes Codey Rocky to drive along the square-shaped line and the linking line.

- Measure the length of one side of the square.
- Measure the length of the linking line.
- Calculate how much time it takes Codey Rocky to drive along a square.
- Calculate how much time it takes Codey Rocky to drive along the linking line.
- Calculate the speed of Codey Rocky (per second). (For instance, if Codey Rocky is programmed to keep moving forward at a power of 50% for 1 second, what is the driving distance then?)

Call the function Square two times under the Events block when button "A" is pressed. Using the repeat block will make your code concise.

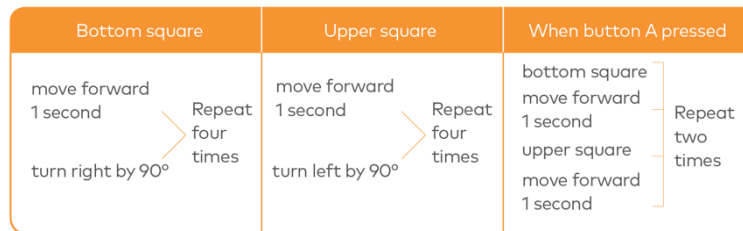
Notes

- Remember to create two functions, Upper square and Bottom square, in your code.
- Measure the length and width of the roadmap. Based on the measurements, you need to figure out how much time it takes Codey Rocky to complete the route.
- The motor of Codey Rocky is a DC motor so Codey Rocky is not able to make turns or follow lines precisely. In this case, all you need to do is to make sure your Codey Rocky roughly follows the line.
- There are multiple ways to make Codey Rocky take the route as shown above. You can work on your own to figure out the solution first, or you can complete the challenge based on the following pseudocode:





ARTIE: Artificial Intelligence in Education - challenges and opportunities of the new era:
development of a new curriculum, guide for educators and online course for students
Project co-funded by European Union under Erasmus+ Programme, 2020-1-HR01-KA201-077800



Students can show some well-done projects. When sharing the projects, students are supposed to give their answers to the questions proposed by others.

CONCLUSION

In programming, Function is a custom coding block. Function refers to a set of instructions that can be called repeatedly in the code.

Methods

presentation
talk/discussion
work on the text
graphic work
interactive exercise /simulation on the computer

Work forms

individual work
work in pairs
group work
frontal work

Material

-

Literature

-

PERSONAL OBSERVATIONS, COMMENTS AND NOTES

