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

TITLE: Let's meet Codey Rocky

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

Essential Idea:	**What programs can do? Let's meet the basics of Codey Rocky and mBlock 5.**

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:

- understand the definition of a program and what a program can do
- get to know Codey Rocky and its features
- master the basics of mblock 5, learn how to upload programs
- understand the concept of events and use the events blocks to create buttons that can function as you would like

Outcomes:

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

Work forms:

- individual work, work in pairs, group work

Methods:

- presentation, talk, discussion, interactive exercise

ARTICULATION
The course of action (duration, minutes)

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INTRODUCTION

The teacher introduces what Codey Rocky is: it's a tiny yet versatile robot.
The teacher can demonstrate the features of Codey Rocky through videos. Or the teacher can upload the programs to Codey Rocky in advance, making the robot perform such tasks as avoiding obstacles, following lines and more.
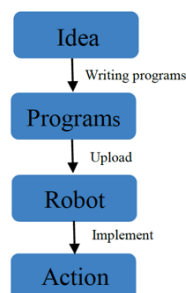
Questions for discussion:
Apart from Codey Rocky, can you think of any other robots?
What are those robots used for?
How can those robots understand our instructions?

Announcement of the goal of the lesson:
The goal of this lesson is to understand the concept of a program and what programs can do, as well as the basics of Codey Rocky and mBlock 5.

MAIN PART

The teacher explains:
Program is an artificial language that we use to tell robots what to do. We translate our instructions into a piece of the program. Then we upload the program to the robot, making it do a variety of things as programmed.

Questions for discussion:
Do you know what the answer is now?
What's the secret of Codey Rocky?
Do you want to write code and upload the code to Codey Rocky?

The teacher explains:
Codey Rocky is an educational programmable robot. You can use software to code the robot, manipulating it to do a variety of things you can imagine. It's also a good companion that can help children learn to code. With mBlock 5, children can master the basics of coding and develop logical thinking as well as computational thinking. Also, Codey Rocky supports technologies like AI and IoT, which expose children to the latest cutting-edge technologies.

ERASMUS+ ARTIE
ARTIFICIAL INTELLIGENCE IN EDUCATION

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Codey + Rocky = Codey Rocky

Codey: As the brain of the robot, Codey is equipped with a variety of sensors and programmable blocks. It can work individually and can also work with Rocky to perform more tasks. Now pick up your Codey. Let's take a look at what sensors it has.

Feature	Block Name	Applications and Core Functions
Input	IR transmitter and IR receiver	Facilitates communication between Codeys and remote controls
	Gear potentiometer	Adjusts the input signals
Input	Gyroscope	Detects how Codey moves and the angles.
	Buttons	Buttons can be programmed to control the facial expressions, motions, and sounds of Codey Rocky.
	Light Sensor	The sensor is used to measure the volume of sounds in the surrounding environments.
	Sound Sensor	The sensor is used to measure the light intensity of surrounding environments.
Output	Speaker	The sensor can be programmed to play music.
	RGB indicator	The indicator can glow in different colors.
	LED matrix screen	The images, texts and time displayed on the screen are all customizable.

Rocky serves as the chassis of Codey. It adds more abilities to Codey, like avoiding obstacles, identifying colors, following lines and more.

IR Color Sensor

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Features	Name	Applications
Input	IR Color Sensor	The IR Color Sensor integrates a color sensor, a grayscale sensor, an IR proximity sensor. By toggling the IR Color Sensor, you can make Codey Rocky perform a variety of fun tasks, like avoiding obstacles, following lines and more.
Input	Motor	The motor is used to control the motion of Rocky.

About mBlock 5

mBlock 5 is a programming tool that supports block-based and Python programming languages. It's developed based on Scratch   3.0, an open-source software tool that's developed jointly by MIT and Google. Using mBlock 5, you can write programs that tell Codey Rocky or other robots to do whatever you would like. You can even take advantage of the software to create stories, games, and animations that are engaging and unique. Moreover, mBlock 5 exposes children to technologies, like AI, deep learning and model training. In a word, mBlock 5 can be one of the best options for first-time coders.

Have students open mBlock 5 PC and walk them through the interface.

Startup Interface:
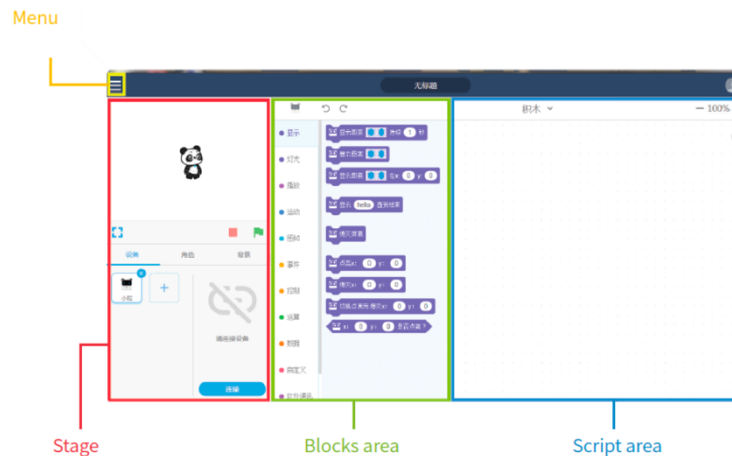
1. Stage: In this area, you can show your projects, connect devices and upload programs, add sprites and backgrounds.
2. Blocks area: You can find the blocks you need by color or category.
3. Script area: You drag blocks to this area to form programs.
4. Device/Sprites/Backgrounds Setting area: From here, you can find the devices, sprites, and backgrounds you need.

The task for students:
Have students practice how to make Codey Rocky move as programmed.
1. Connect to a computer: Connect Codey to the computer via the USB cable. Then power on Codey.
2. Select the serial port: Open mBlock 5, click Connect, and select the correct serial port.

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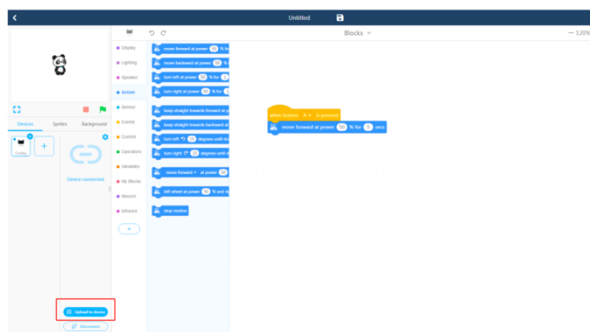Project co-funded by European Union under Erasmus+ Programme, 2020-1-HR01-KA201-077800
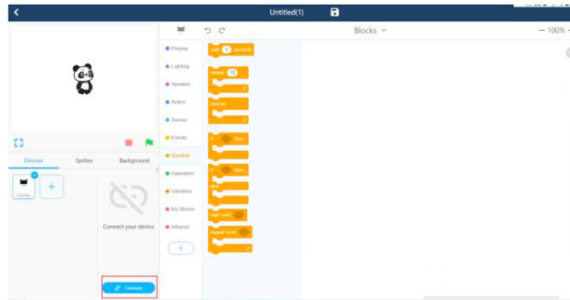
Click Connect
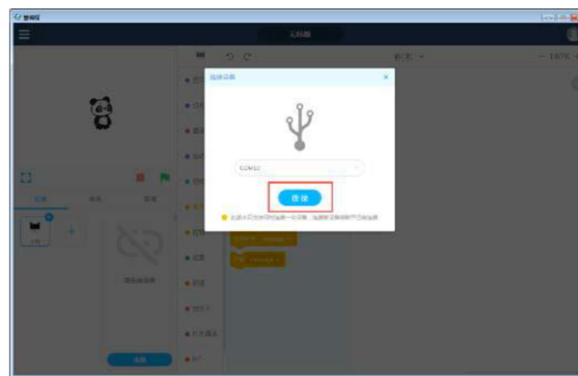
3. Use mBlock 5 to create a piece of the program as shown below:
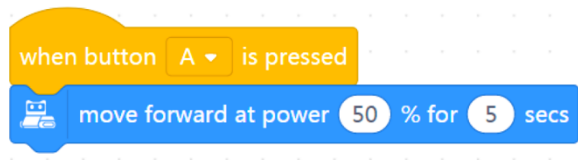
4. Upload the program to Codey.

5. Unplug the USB cable and put Codey Rocky on the table. Press button A and observe how Codey Rocky reacts. Have students work in pairs to complete the tasks above by writing programs.

About Events
Expose students to the concept of Event. Tell students what an Event refers to. For example: When it gets dark and we enter a room, we need to turn on the light. To turn on the light, we need to press the light button. In this case, pressing the button is an event and that the light is turned on is the result.
Invite students to play a game, helping them have a better understanding of the concept.

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Game rules:

Divide the students into 3 or 4 groups.

Draw some figures on the blackboard, like triangle, circle, square and star.

Define 3 or 4 events:

1. When you put your hand on the triangle;
2. When you put your hand on the circle;
3. When you put your hand on the square;
4. When you put your hand on the star.

The four events above trigger the actions below:

1. When you put your hand on the triangle —the 2nd group of students stands up;
2. When you put your hand on the circle—the 4th group of students stands up;
3. When you put your hand on the square—the 1st group of students stands up;
4. When you put your hand on the star—the 3rd group of students stands up.

Game procedure and teaching preparation:

1. Draw figures on the blackboard.
2. Divide students into groups and have them get ready for the game.
3. Put your hands on a shape randomly and check whether students react as required.
4. If students react as you expect, then you put your hand on another shape. If students fail to react as required, you need to repeat the game rules to students.
5. Repeat the game several times and speed up the process of switching between shapes.
6. You need to give a summary: In this case, the hand serves as an event. When the hand points to one shape, one specific group of students is expected to stand up as required.
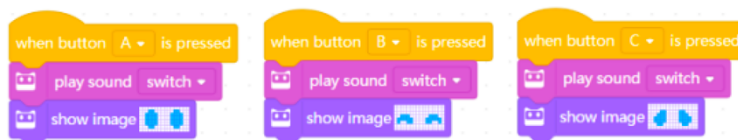
Task 1:

Learn how to set events. Write programs to make Codey Rocky change its facial expressions based on the events. (when button A/B/ C is pressed).
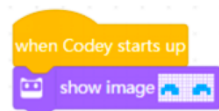
Task 2:

Write programs to make Codey Rocky react in response to the events (when button A/B/C is pressed), like changing its facial expression or making different sounds. Have students share their projects.

Examples:

Students are expected to share their projects with the whole class and give their answers to the following questions:

What is your project about?

Did you come across any problems?

How did you solve them?

CONCLUSION

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Program is an artificial language that we use to tell robots what to do. We translate our instructions into a piece of a program. Then we upload the program to the robot, making it do a variety of things as programmed.

The interface of mBlock 5 consists of: Stage area, Blocks area, Scripts area, Device/Sprites/Backgrounds Setting area.

An event is the beginning of a piece of a program. When you write programs, the first thing you need to do is to select an event.

Methods		Work forms
presentation	*interview*	*individual work*
talk/discussion	*demonstration*	*work in pairs*
work on the text	*role playing*	*group work*
graphic work		*frontal work*
interactive exercise /simulation on the computer		

Material

-

Literature

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PERSONAL OBSERVATIONS, COMMENTS AND NOTES