



TITLE: Codey Rocky drives safely and responsibly

LEARNING SCENARIO

<i>School:</i>	<i>Duration (minutes):</i>	90
<i>Teacher:</i>	<i>Students age:</i>	10+

Essential Question:

How does Codey Rocky make decisions?

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 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

The teacher starts a discussion:





What is a condition?

Do we make decisions in everyday life?

What kind?

Sample answers:

Every day we make decisions about what we wear: lighter or warmer clothes. We make decisions depending on the weather conditions.

Can robots make decisions?

Can robots see and feel the environment around them?

Announcement of the goal of the lesson:

The goal of this lesson is to understand the conditions, meet and use Codey Rocky sensors to complete tasks.

MAIN PART

The teacher explains:

Conditional refers to the instructions that depend on whether something is true or false. The instruction will be executed only when the if statement is true; otherwise, the program will skip the instruction. In the conditional block, there is a hexagonal hole, you need to put the condition code inside the hole.

Hexagonal blocks return Boolean values (with only two possible values: true or false). A Boolean variable has only two values, 1(true) and 0 (false). If the if statement is true, the Boolean variable will return the value "true". Otherwise, it will return the value "false". Therefore, we also refer to the hexagonal blocks as Boolean blocks.

Game: Conditional Box

1. The teacher will hand out some paper strips. Write down some conditional statements on the paper strips. Please make your statements easy to identify. Here are some examples for you: If you have long hair; if you wear glasses; if you are dressed in black; if your name includes the letter "A"; if you were born in June; if someone puts his or her hands up. Don't make your statements hard to identify (like "if it rains tomorrow" or "if the amount of your hair is an odd number"). These statements will be considered invalid.
2. Fold the paper in half and put it into the box.
3. Follow the teacher's instructions and pick a paper strip out of the box. Open it, read out loud what it says and make a decision. If the conditional statement is true, carry out the action. If it's false, then skip it.
4. Fold the paper in half and put it back into the box. Go back to your seat or hand the box to the next student.

Before writing programs, you need to identify where the color sensor is located.

There is a row of sensors at the front bottom of Rocky, including Color Sensor, Grayscale Sensor, IR Proximity Sensor and other sensors.



Infrared Color Sensor

The Color Sensor is in the middle. It can identify multiple colors, like red, green and blue.

Task 1: Racing Game

Create and test a program:

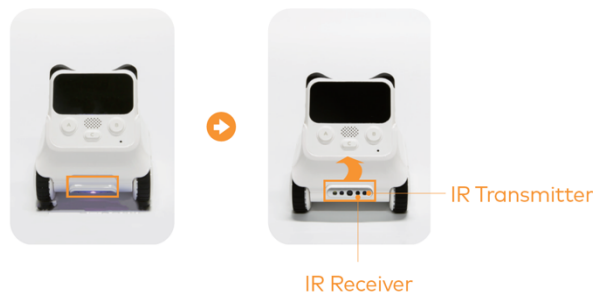
If Codey Rocky sees the green flag waving, it will start at its top speed.



When button A is pressed, Codey Rocky is getting ready at the starting line (play the sound ready).
If the color detected is green, Codey Rocky will move forward at its top speed.
The RGB LED will turn red once the program makes a decision based on the situation.
If Codey Rocky identifies a red item, it will move backward.

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

The IR Proximity Sensor is inside the Color Sensor (the left arrow indicates the IR receiver and the right arrow indicates the IR transmitter). With the IR Proximity Sensor, Codey Rocky can avoid obstacles. But you need to make sure the Color Sensor always faces forward when it is detecting obstacles.



Task 2: Avoid the Obstacle

Create and test program:

When meeting an obstacle, Codey Rocky will avoid it and keep moving forward.

Place an item in front of Codey Rocky.

When button A is pressed, if Codey Rocky detects an obstacle, it will turn right by 90 degrees, move forward, turn left by 90 degrees and keep moving forward at a rapid speed.

If Codey Rocky fails to detect any items, it will move forward at its top speed.

Let Codey Rocky display facial expressions and make a sound when it meets an obstacle.

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

At the bottom right corner of Codey, there is a black dot. The black dot is the Light Sensor. It is used to measure the light intensity of surrounding environments. In the middle of Codey, you will find the RGB Indicator. It can shine in colors.



There are two ways to access the value of the Light Sensor:

When the device is connected, tick the „ambient light intensity" block to display the value on the stage.




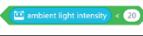
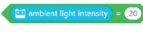


ARTIE: Artificial Intelligence in Education - challenges and opportunities of the new era:
development of a new curriculum, guide for educators and online course for students
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Or you can use the scripts below to display the value on Codey's LED screen. Upload the programs above to Codey. Observe how the value changes on the stage and the LED screen.



In daily life, we need to compare values. Based on the results, we make decisions. Different decisions often lead to different actions. For instance, "If my temperature is beyond 38, I need to go to the doctor." Based on the thermometer value, we'll decide whether it's necessary to go to the doctor. Similarly, we can use Comparison Operators in mBlock 5 to compare two values. The Comparison Operators include: < operator, = operator and > operator.

Comparison Operators	Implication	Example
	Less than	 The ambient light intensity value is less than 20.
	Equality	 The ambient light intensity value equals 20.
	Greater than	 The ambient light intensity value is greater than 20.

Task 3: The Tunnel

Create and test program:

When entering a dark tunnel, Codey Rocky will turn on its light and slow its speed.

Stick a black paper on the Light Sensor of Codey Rocky.

When button A is pressed, Codey Rocky will move forward at its top speed.

If the light intensity is below 20, Codey Rocky will turn on its white RGB indicator and drive at a slower speed.

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 languages, Conditional refers to the instructions that depend on whether something is true or false.



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

Material
<ul style="list-style-type: none">•

Literature
<ul style="list-style-type: none">•

PERSONAL OBSERVATIONS, COMMENTS AND NOTES

