Erasmus+

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Teaching programming in primary school:
curriculum, didactic methods, textbooks, online support
CodeInnova

TITLE: Connecting LEDs to a micro:bit

LEARNING SCENARIO		
School:	*Duration (minutes):*	**90**
Teacher:	*Students age:*	**14**

Essential Idea:	Connecting LEDs to a micro:bit

Topics:

- Pupils deepen their understanding of the meaning, potential and risks of programming at a society level.
- Pupils learn to use artificial intelligence.

Aims:

- Pupils are able to design, create, document, and present programs and robots that solve a particular real-life problem. Created programs include search algorithms, tables and automatic functions. Several simultaneous events happen in these programs.

Outcomes:

- Pupils create more complex games, applications or mobile applications that simulate subject matters.
- Pupils learn about the potential and features of more advanced microcontrollers.

Work forms:

- individual work
- work in pairs
- group work

Methods:

- presentation
- discussion
- interactive exercise

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ARTICULATION
Course of action (duration, minutes)

INTRODUCTION

Teacher starts discussion with pupils:

A micro:bit has output pins that allow it to be connected to different components or sensors.
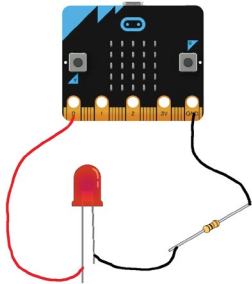
MAIN PART

If you have a LED diode, a 100 ohm resistor and three wires, you can connect the LED to your micro:bit.

One wire should be connected to the micro:bit output marked as GND and to one side of the resistor.

Then the second wire goes from the other side of the resistor to the (-) on the LED.

The (+) on the LED is connected directly to the zero (0) on the micro:bit.

The working voltage of the micro:bit is 3 Volts, while the voltage of the LED is a bit smaller, which is why we're using a resistor. It this example it is best to use a battery to power the micro:bit.

The next program will turn the LED on and of with 500 milisecond intervals.

```
1  from microbit import *
2
3  while True:
4
5      pin0.write_digital(1)
6      sleep(500)
7      pin0.write_digital(0)
8      sleep(500)
```

If you have multible LED's you can try to connect more of them to a micro:bit. Use the pins 0, 1, and 2. If you have a green, yellow and a red LED – you can try and build a stoplight.

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EXCERCISE

According to the previous example, pupils can design, create and test their own programs.
Examples:
https://makecode.microbit.org/reference/led

> plot
>
> unplot
>
> point
>
> brightness
>
> setBrightness
>
> stopAnimation
>
> plotBarGraph
>
> toggle
>
> setDisplayMode
>
> enabled
>
> plotBrightness

CONCLUSION

Pupils and teacher discuss and evaluate the presented solutions.

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

Material:

- micro:bit
- LED diode

Literature

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- https://makecode.microbit.org/reference/led:
  plot
  unplot
  point
  brightness
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  enabled
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PERSONAL OBSERVATIONS, COMMENTS AND NOTES