

# Lesson plan

2023-1-SK01-KA220-SCH-00015112



<b>Topic</b>	Health	
<b>Block name</b>	Follow your heart – measuring your heart rate while moving	
<b>Age category</b> 13 – 15	<b>Age category</b> 135 minutes	<b>Number of teaching hours</b> 3
<b>Student-centered educational goals (content and performance standards)</b>  <b>Content standard:</b> <ul style="list-style-type: none"> <li>understands the concept of heart rate and its relationship to physical activity</li> <li>can describe the importance of heart rate monitoring for health and prevention</li> <li>can use digital technologies to collect and evaluate data</li> </ul> <b>Performance standard:</b> <ul style="list-style-type: none"> <li>can program a micro:bit with a pulse sensor to measure heart rate</li> <li>can record and evaluate measured data</li> <li>can interpret the results in the context of a healthy lifestyle</li> </ul> <b>Integration of subjects:</b> <ul style="list-style-type: none"> <li>Science (biology): cardiovascular system, physiological responses of the body to stress</li> <li>Mathematics: data processing and graphical representation</li> <li>Technology/INF: micro:bit programming, working with sensors</li> </ul> <b>21st century skills:</b> <ul style="list-style-type: none"> <li>analytical thinking</li> <li>digital literacy</li> <li>teamwork</li> <li>data interpretation</li> </ul>		
<b>Didactic aids and teaching techniques:</b> <ul style="list-style-type: none"> <li>micro:bit</li> <li>pulse sensor compatible with micro:bit</li> <li>USB cable, battery module</li> <li>computer/laptop with internet access</li> <li>data recording table (paper or online)</li> </ul>		
<b>References / Resources (videos, methodologies):</b> <ul style="list-style-type: none"> <li><a href="https://www.microbit.org/">https://www.microbit.org/</a></li> <li><a href="https://makecode.microbit.org/">https://makecode.microbit.org/</a></li> <li>methodological materials about pulse sensors (e.g. Gravity: Heart Rate Sensor)</li> </ul>		
<b><u>Motivational phase:</u></b>  <b>Duration:</b> 20 minutes		

**Objective:** The student will realize the importance of monitoring bodily functions and discover how technology can help promote health.

**Introductory activity – motivation:** The teacher plays a short video or shows a real sports bracelet that measures heart rate. He compares it with a simple micro:bit-based system.

**Introduction to the issue (keywords):** heart rate, pulse, physical activity, health, sensor

**Interactive questions and answers:**

- What is heart rate?
- How does the heart rate change at rest and during exercise?
- Why do athletes monitor their pulse?
- How can the micro:bit help with heart rate measurement?

**Explain the purpose of the activity:** to show students that digital tools can be used to monitor their health. ~~Get motivated students will use their own micro:bit to measure their heart~~

**Exposure phase (discovery):**

**Duration:** 95 minutes

**Objective:** To learn how to work with a pulse sensor and micro:bit, record and evaluate the measured data.

**Science Integration:**

- comparison of resting and exercise heart rate
- discussion about optimal heart rate values during exercise

**Informatics integration:**

- programming the micro:bit in MakeCode to read data from the sensor and display the result
- saving measured values in a table

**Activities:**

1. Connecting the pulse sensor to the micro:bit according to the diagram.
2. Programming the micro:bit to measure and display heart rate (BPM).
3. Measuring pulse at rest – recording values in a table.
4. Measuring your pulse after a short physical activity (e.g. 20 squats or a short run).
5. Comparison and discussion of differences.

**Group discussion:**

- What did you find out about your pulse?
- Why does the pulse increase when moving?
- How can this measurement help with training or health monitoring?

**Fixation phase (fixing and deepening):**

**Duration:** 20 minutes

**Objective:** to verify and consolidate the knowledge and skills acquired during the lesson.

**Activities:**

- Design a simple micro:bit application that alerts you if your heart rate exceeds a set limit.

- Create a short presentation of the group's results

**Student evaluation:**

- program functionality
- correct sensor connection
- ability to interpret results
- teamwork

**Attachments:**

- sensor wiring diagram
- sample MakeCode program
- table for recording values