Lesson plan

2023-1-SK01-KA220-SCH-00015112

Topic	Environment	
Block name	We measure temperature and humidity in various environments	
Age category 12– 15	**Duration** 135 minutes	**Number of teaching hours** 3

Student-centered educational goals (content and performance standards)

Content standard:

- understands the importance of monitoring temperature and humidity for environmental quality
- can explain how these factors affect people, animals and plants
- controls the principle of measurement via digital sensors

Performance standard:

- can program micro:bit with temperature-humidity sensor
- can record and evaluate measured data
- can compare measured values from different environments

Integration of subjects:

- Science: environmental education, physics (temperature as a physical quantity, relative humidity)
- Mathematics: data processing, average, graphs

- Technology/INF: micro:bit programming, working with sensors

21st century skills:

- analytical thinking,
- digital literacy,
- working with data

Didactic aids and teaching techniques:

- micro:bit
- temperature-humidity sensor (e.g. DHT11/DHT22)
- USB cable, battery module
- computer/laptop with internet access
- data recording table (paper or online)

References / Resources (videos, methodologies):

- https://www.microbit.org/
- https://makecode.microbit.org/

Motivational phase:

Duration: 20 minutes

Objective: The student will understand that temperature and humidity are key environmental factors affecting the quality of life.

Introductory activity – motivation: The teacher brings two different "environmental samples" – for example, a watered potted plant and a dry substrate. He compares them and asks the students which one has more moisture.

Keywords: temperature, humidity, microclimate, environment

Interactive questions:

- How do you feel in hot and dry weather?
- Why do plants need a certain amount of moisture?
- Where could we measure temperature and humidity to get interesting data?

Exposure phase (discovery):

Duration: 95 minutes

Objective: Learn to measure temperature and humidity using the micro:bit, record and compare data from different locations.

Science Integration:

- the importance of optimal temperature and humidity for humans and plants

Informatics integration:

- programming the micro:bit to read values from the sensor and display them on the display
- recording data in a table

Activities:

1. Connecting the DHT11/DHT22 sensor to the micro:bit.
2. Programming the micro:bit to display temperature and humidity.
3. Measurement in the classroom, in the hallway and outside.
4. Comparison of results in the table.

Group discussion:

- Which environment had the best conditions?
- How could this data be used in practice?

Fixation phase (fixing and deepening):

Duration: 20 minutes

Objective: To consolidate knowledge and connect it to real life.

Activities:

- Design a device that triggers an alarm when a temperature or humidity limit is exceeded.

Student evaluation:

- program functionality
- data accuracy
- ability to interpret results

Attachments:

- Wiring diagram of the DHT11/DHT22 sensor to the micro:bit (color-coded pins – VCC, GND, DATA)

- Sample MakeCode program to display temperature and humidity on the micro:bit LED display and store it in a variable
- Table for recording measurements:

Measurement Location	Temperature (°C)	Humidity (%)	Measurement Time	Notes
Classroom				
Corridor				
Outdoor Environment				

- Graphical representation of results - example of a simple bar graph from a table
- Photo of DHT11/DHT22 sensor for visual component identification