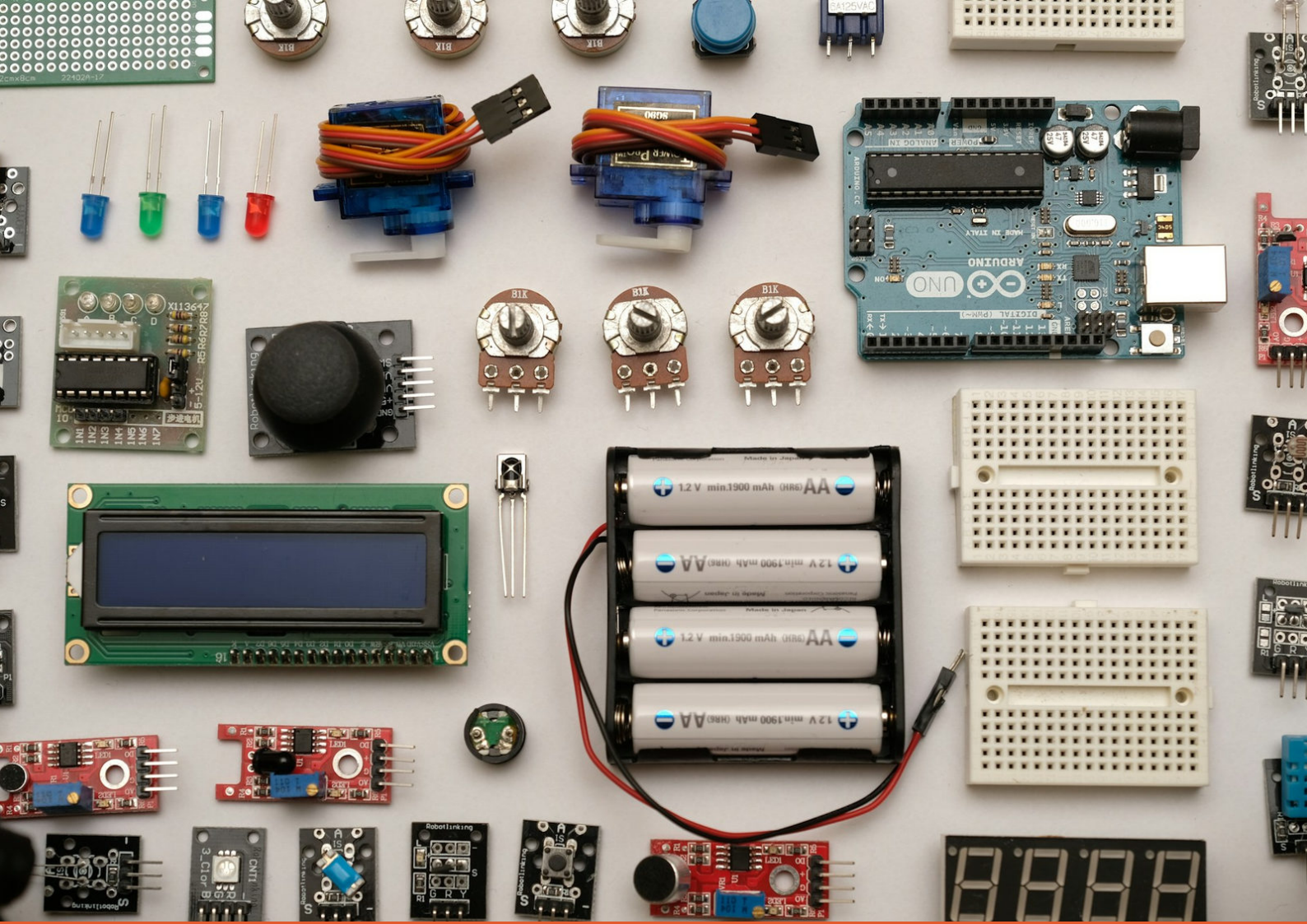




EduTrend Contents

EDUTECH · STEM RESOURCES FOR TEACHERS · HIGH SCHOOL

Micro:bit Environment Logger

Program a micro:bit to log light or temperature and analyse the data

Ages 15–18

Level: Advanced

90 minutes

Teams of 3

Activity 05

Inside: activity at a glance · step-by-step session plan · facilitator notes · 3 student worksheets · assessment checklist

ACTIVITY 05 · AT A GLANCE

Micro:bit Environment Logger

Teams use the free MakeCode editor to program a BBC micro:bit to take a temperature or light reading at set intervals and record it. They place loggers in different locations, collect and export data, plot it in a spreadsheet and draw conclusions. They also test sensor accuracy against a thermometer.

Learning outcomes

By the end of the session students can:

- program a sensor to take readings;
- plan a data collection;
- analyse time-series data;
- evaluate sensor reliability.

KEY WORDS

sensor · data logging · interval ·
time series · calibration · accuracy

CURRICULUM LINKS

Science: energy and heat.
Geography: microclimates. Maths:
graphs and averages.

1**QUESTION**

What will we find
out?

2**PREDICT**

What do we
expect?

3**EXPLORE**

Use the resource

4**RECORD**

Capture evidence

5**EXPLAIN**

What did we learn?

6**EXTEND**

Where next?

Materials (per team)

- BBC micro:bit (V2 recommended for data logging)
- Battery pack
- Computer with MakeCode
- Reference thermometer
- Worksheets 1, 2 and 3

Before the session

- Check micro:bits and batteries.
- Test MakeCode access.
- Agree logging locations.
- Print worksheets.

SAFETY

Keep devices away from water and heat sources. Get permission before placing loggers around school.

ACTIVITY 05 · SESSION PLAN

Step by step

The micro:bit temperature reading comes from its processor, so compare it with a thermometer.

Time	What happens	Say or ask
0–15 min Question	Where is the warmest place in school?	<i>"How could we find out?"</i>
15–35 min Program	Code a logger in MakeCode.	<i>"What interval makes sense?"</i>
35–60 min Collect	Place loggers and collect.	<i>"Is the test fair?"</i>
60–80 min Analyse	Spreadsheet graphs.	<i>"What pattern appears?"</i>
80–90 min Evaluate	Compare with a thermometer.	<i>"How reliable is the sensor?"</i>

CHALLENGE CARD (print or copy onto the board)

Program a micro:bit to log temperature or light, collect data in two locations, analyse it and evaluate the sensor's accuracy.

ACTIVITY 05 · FACILITATOR NOTES

The teaching know-how in brief

The BBC micro:bit has built-in sensors, including temperature and light. The temperature reading comes from the processor, so it can read slightly higher than the air around it.

Data logging records readings at regular intervals, producing time-series data. Calibration against a trusted instrument shows how accurate a sensor is.

Common ideas to listen for

- “The sensor is always right.” Check against a reference.
- “More readings are always better.” Choose a sensible interval.
- “One location represents the school.” Compare several.

Adapting the activity

Support

Provide a starter program.

Stretch

Add a calibration correction in code.

WORKSHEET 1

Logging plan

Name: _____

Class: _____ Date: _____

Plan your data.

Logging plan

Item	Plan
Question	
Sensor	
Interval	
Locations	
Duration	

WORKSHEET 2

Calibration

Compare readings.

Calibration

Time	micro:bit reading	Thermometer	Difference
1			
2			
3			
4			
5			

WORKSHEET 3

Conclusions

Analyse and evaluate.

What the data shows and how reliable it is

FOR THE TEACHER

Assessment checklist

Use during the session. One sheet covers up to eight students; copy as needed.

Student	Programs logger	Analyses data	Evaluates reliability

Suggested codes: W = working towards · E = expected · G = greater depth

ABOUT THIS ACTIVITY

Micro:bit Environment Logger is a sample activity from the EduTrend Contents Edutech STEM Resources for Teachers programme (high school, level: advanced). Every activity in the programme follows the same format: a practical challenge, a clear session plan, facilitator notes and ready-to-print worksheets, so that teachers, club leaders and parents can run it without extra preparation.

Full 15-, 20- and 32-week programmes are available from EduStore at edutrend.org.

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