

Measure your classroom: temperature, humidity & CO₂

A ready-to-run first lesson with HARDWARIO TOWER — students build a wireless sensor and read live data from the room. No soldering, no programming.

🕒 45–90 min

👥 2–3 students / set

📚 IT · Physics · Project work

🎓 Lower-secondary & up

📅 ~15 min prep

WHAT STUDENTS WILL LEARN

- Assemble a working wireless sensor device from modules — no soldering
- Read real-time temperature, humidity and CO₂ from the classroom
- Follow the path: sensor → radio → USB dongle → HARDWARIO Playground
- Interpret the data and link it to a real action (ventilation)

WHAT YOU NEED

- TOWER Core Module + Battery Module
- Climate Tag (temp/humidity) + CO₂ Module
- Radio Dongle (USB)
- A computer with a web browser
- The free STEM mini-course (stem.hardwario.com)

LESSON FLOW

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|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0–5 min | Hook. What is the Internet of Things? Sketch the idea: a sensor measures the real world, sends data by radio, and we read it on a screen. |
| 5–15 min | Assemble. Each group snaps the modules onto the Core Module. Nothing to solder — the connectors only fit one way. |
| 15–25 min | Set up & connect. Following the STEM mini-course, install HARDWARIO Playground, upload the ready-made firmware and plug in the Radio Dongle — the device connects and starts reporting. |
| 25–35 min | Measure live. Read temperature, humidity and CO ₂ live in HARDWARIO Playground. Breathe near the sensor or open a window — watch the numbers react in real time. |
| 35–45 min | Interpret. Discuss the trends together: why does CO ₂ rise in a full classroom? When should you ventilate? |

Extension / homework: log the values over a week, chart them, and compare two rooms — bridges IT, physics and project work.

TEACHER NOTES

- **Safe:** everything runs on low voltage from AAA batteries — no mains, no soldering, no hot tools.
- **No coding required:** the STEM mini-course provides ready-made firmware and a step-by-step script.
- **Hands-on for everyone:** 2–3 students per set keeps the whole group involved.