

# Instructional Plan

## Eau là là - Measuring Water Use through Sensors and Data

### Literacy

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## Summary

1. **Subject(s):** Science, Technology (Engineering), Environmental Education, Digital Citizenship
2. **Topic or Unit of Study:** Water consumption awareness, sensor-based measurement, and data literacy
3. **Grade/Level:** Secondary students (approximately ages 12–18)
4. **Key Skills Being Developed:** Critical thinking, data interpretation, ethical reasoning, systems thinking, collaborative discussion
5. **Time Allotment:** 90 minutes (hands-on workshop and guided discussion)

## Learning Plan

### Objective(s):

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### Context and Purpose:

This lesson is part of a learning sequence focused on measurement, water use, and data understanding. It begins with a concrete situation: learners first estimate the amount of water needed to clean paintbrushes, then compare their estimation with a real measurement obtained using a flow meter they have built themselves.

The purpose is to highlight the possible gap between perception and reality, to raise awareness about water consumption, and to show how sensors make usage measurable and comparable. Based on this experience, learners are encouraged to reflect on how data is interpreted and on what conclusions can, or cannot, be drawn from measured values.



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Project funded by



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## Method and Procedure

### Opening / Initiating Activity

The lesson begins with a discussion about water consumption, distinguishing between visible and direct uses (drinking, cleaning, washing) and indirect or “hidden” water consumption linked to everyday goods and services (clothing, food, energy). Learners are invited to estimate their own water consumption and are then presented with real reference figures, allowing them to compare perception with reality.

To explore personal perceptions of climate change, learners choose a color and an animal that, in their view, represent climate change. They paint the chosen animal in the selected color on a sheet of paper. The artworks are displayed and discussed collectively, highlighting differences in emotions, representations, and sensitivities among participants.

The activity then shifts to concrete action. Learners reflect on everyday behaviors that have a positive environmental impact, even when they are not motivated by environmental concerns (for example, cycling to school because it is faster or more practical). They are encouraged to identify similar actions in their own lives.

Finally, learners are asked to estimate the amount of water needed to clean the paintbrushes and materials used during the activity. These estimations are written on post-it notes and displayed, preparing the transition to the measurement phase of the workshop.

### Learning Activities

- Construction and setup of a simple water flow sensor (flow meter)
- Measurement of the actual water consumption used to clean the paintbrushes
- Individual or group recording of measured values
- Comparison between estimated water consumption and measured results
- Collective sharing of results to identify differences and trends
- Visualization and interpretation of the collected data
- Guided discussion supported by visual slides, introducing notions such as data use, data interpretation, and ethical questions related to measurement and sensors

### Closing Activity

The session concludes with a collective reflection. Learners are invited to recall what they observed during the presentation and the experiment, including their initial estimations, the measured results, and the differences between them. They are encouraged to share their viewpoints on water consumption and climate change, and to reflect on how everyday habits may use more water than expected.

The discussion aims to raise awareness rather than reach a single conclusion, helping learners connect their observations to broader environmental issues and personal responsibility.

# Materials & Resources

- Paintbrushes
- Gouache
- A0 Paper
- Water flow sensors components (to be assembled on a breadboard)
- Microcontrollers (for sensor data acquisition)
- Sink with running water
- Computer and projector
- Internet connection (optional, for data visualization or discussion examples)
- Visual slides for guided discussion
- Whiteboard or flipchart for collecting ideas and arguments

## Assessment

### Formative

- Observation of learner engagement during hands-on activities and discussions
- Relevance of questions asked and quality of contributions during group exchanges
- Ability to explain, in simple terms, what the sensor measures and what the collected data represents

### Interim

- Group interpretation of the measured water consumption values
- Ability to compare estimated and measured data and to identify differences or limits in interpretation

### Summative

- Short reflective discussion or written response focusing on awareness and responsibility, for example:

“What did you learn about water use and measurement during this activity?”

## Outcomes and Impact

### Short-term

- Increased awareness of personal and collective water consumption
- Improved understanding of how measurement tools make consumption visible

### Medium-term

- Greater attention to everyday water-related habits
- Improved ability to question and discuss the role of measurement and connected technologies

### Long-term

- Development of informed and critical attitudes toward data and measurement systems
- Stronger connection between technological understanding, environmental awareness, and personal responsibility

Project Name:	LEVERS: Learning Ventures for Climate Justice
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Consortium	Trinity College Dublin, School of Education (TCD), Ireland Centar Za Promociju Nauke (CPN), Serbia Center For Social Innovation Ltd (CSI), Cyprus European Association For The Education Of Adults (EAEA), Belgium Forth Together CIC (FOR), United Kingdom LATRA EE (LAT), Greece Onl'fait (OLF), Switzerland Sociedade Afonso Chaves, Expolab - Centro Ciência Viva (SAC), Portugal Stickydot Srl (SD), Belgium University College London, Climate Action Unit (UCL), United Kingdom Zavod Za Kulturo, Umetnost In Izobrazevanje Kersnikova (Kersnikova), Slovenia
Funding scheme	HORIZON-WIDERA-2022-ERA-01-70 - Open schooling for science education and a learning continuum for all HORIZON-Coordination and Support Action (CSA)
Duration	March 2023 – February 2026 (36 months).
Budget	EU contribution € 1 513 997,00
Website	<a href="http://www.leversforclimate.eu">www.leversforclimate.eu</a>
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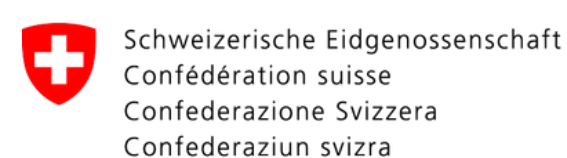
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