How to integrate the SDGs in STEM lessons – New teaching material with hands-on examples

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About Science on Stage Europe

▸ ...is a network from and for STEM teachers of all school levels.

▸ ...provides a European platform for the exchange of teaching ideas.

▸ ...highlights the importance of science and technology in schools.

The challenges

▸ How to address the topic of sustainability in school and implement the 17 SDGs in STEM education

▸ How to connect STEM subjects to the daily life of the students and show their relevance

▸ How to foster agency and promote more sustainable decision making in students

The project

- ▸ 20 teachers from 12 countries
- ▸ More than 2 years of collaborative work to create and test teaching materials

The teaching material **Act Now** for the UN Sustainable Development Goals
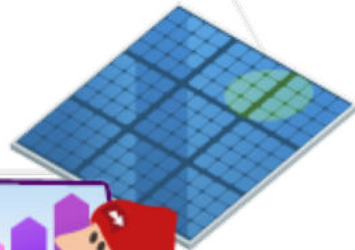
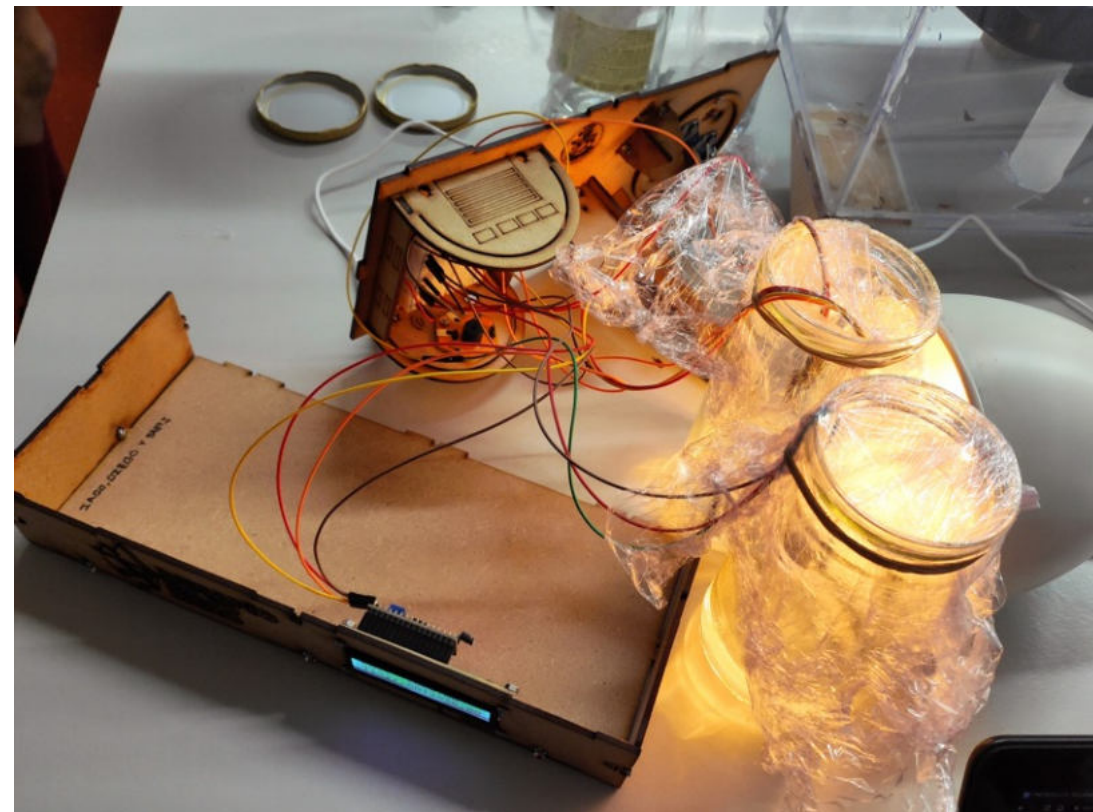**The 3 Rs and the Products of the Future**

Smart Cities

Adopt a Tree

An Apple a Day Keeps the Climate Okay

Climapse

CO2MUCH – Think Global, Act Local

Sustainability in a local context

On 19th September 2021, a violent tornado hit the airport area.

Hands-on experiments

Students gather their own data

Development in the course of a day

measured in October
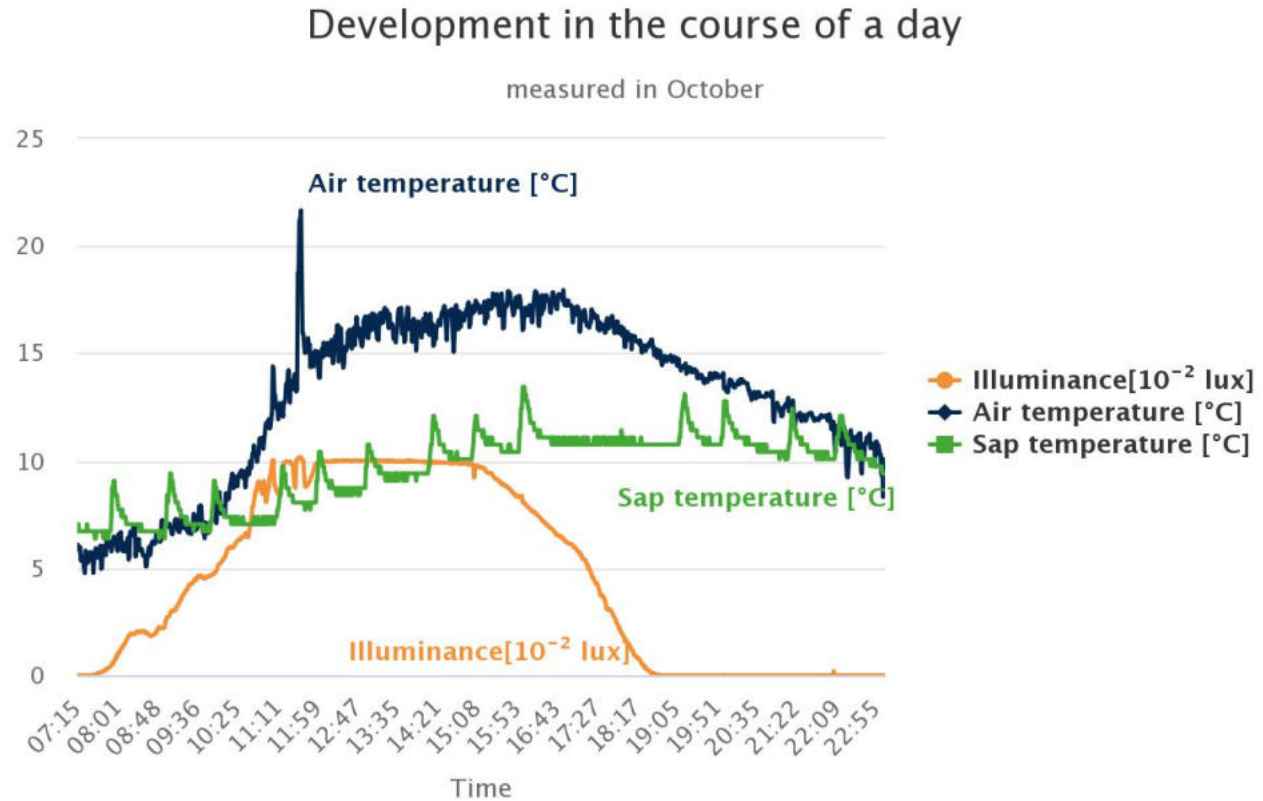
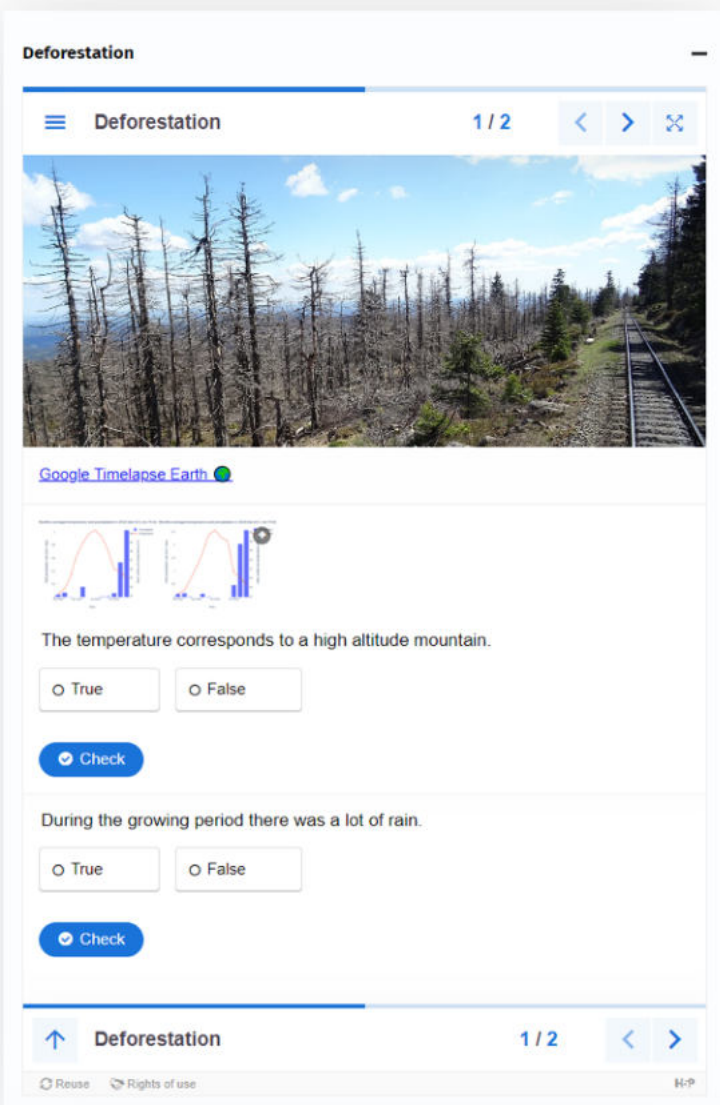# Use scientific data and online monitoring tools
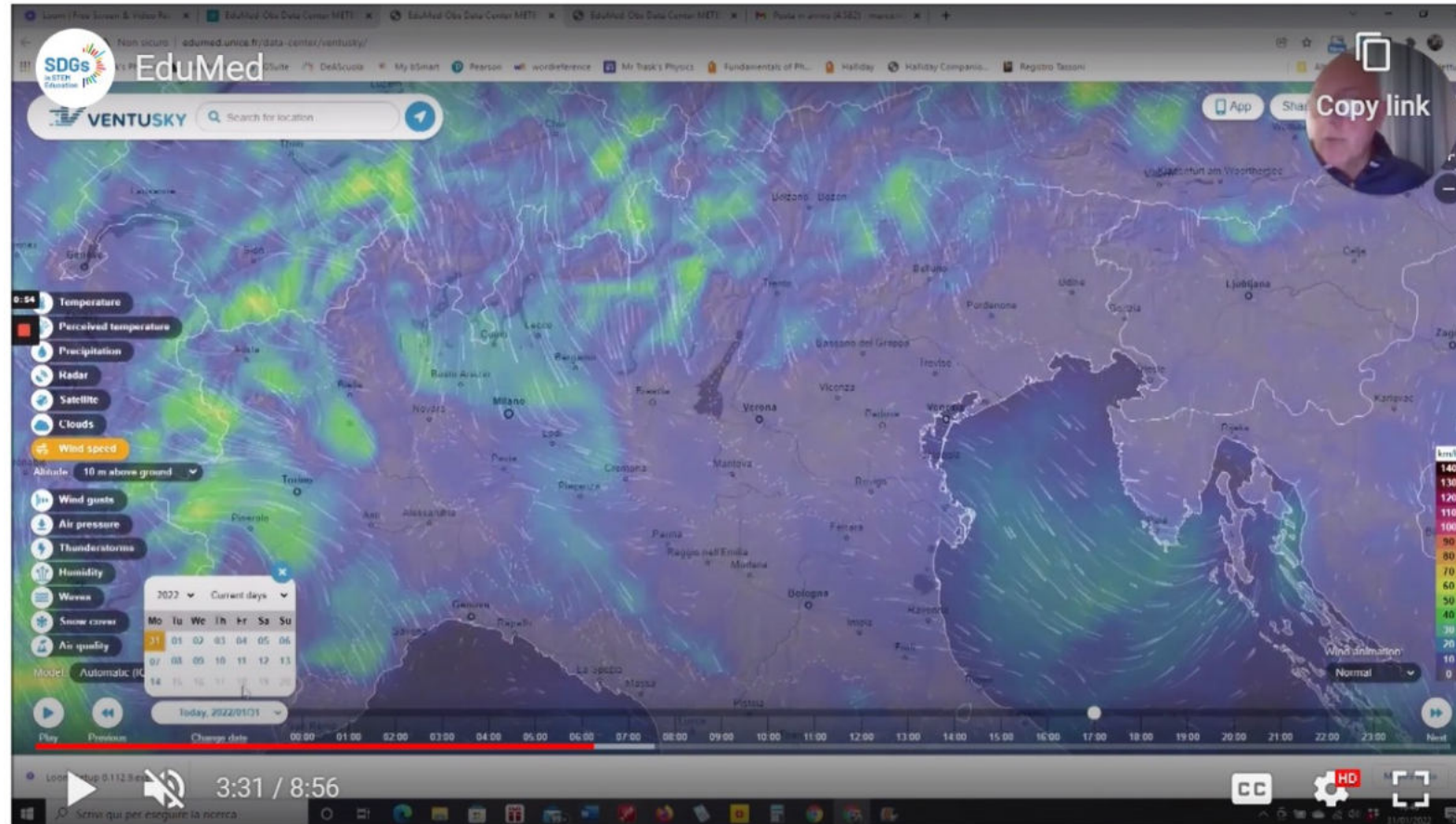
Students take action

Interactive elements: H5P

- ▸ Use directly with students

- ▸ Download to adapt/translate

- ▸ Integrate in different learning systems (e.g. school moodle)

- ▸ Works in browser on any device

The teaching materials

‣ Six teaching topics from single lessons to whole projects

‣ Covering 12 of the 17 SDGs

‣ Tested by teachers from different countries – from teachers for teachers

‣ Digital content - added value through videos, code tutorials, interactive work sheets, etc.

‣ Published under Creative Commons License (CC-BY-SA)

‣ **www.science-on-stage.eu/act-now-sdg**

‣ Also available in German
www.science-on-stage.de/act-now-nachhaltigkeit

Get involved – The Competition

- How to implement one of the 17 SDGs in the classroom

- Task: Develop a project with your students and document the implementation in English: poster, short film (max. 90 seconds) + description.

- 10 Teams (2 teachers + 3 students) will be invited to present their project in Berlin in Nov 2023

- **Deadline for submission: 15 June 2023**

- **www.science-on-stage.eu/future-league**

Thank you for your attention!

www.science-on-stage.eu

Additional information

Climapse

▸ What can we learn from weather data?

▸ Introduction to show the impacts of climate change in the location of the students

▸ Microcontroller: Students use them to gather their own data

▸ Online Monitoring Tools: Students analyse scientific data and satellite imagery to create their own time series

▸ Take Action: Students learn how to communicate their findings

Smart Cities

▸ What are smart cities and what does sustainability have to do with them?

▸ Energy for Tomorrow: Looking at the generation of solar electricity in cities

▸ Air Pollution: Global databases are used to investigate air pollution in different cities

▸ Air Quality: Students monitor air quality parameters using Arduino based data loggers

The 3 Rs and the Products of the Future

- 3 Rs stand for *Reduce, Reuse, Recycle*

- Inspired by the need to find more sustainable ways to create everyday products

- Bioplastics: Production and recycling

- Keratin: What can you do with wool?

- Cement: make cement from mussel shells

CO2MUCH – Think Global, Act Local

- ‣ Raise awareness of climate change and acidification of oceans

- ‣ Production of carbon dioxide in combustion processes

- ‣ Greenhouse effect and temperature

- ‣ Ocean acidification

- ‣ Hydrogen fuel cells as possible solution to the problem

CO2MUCH – Think Global, Act Local

An Apple a Day Keeps the Climate Okay

▸ The apple as door opener to biodiversity

▸ Tree identification and biodiversity

▸ Production (local, imported, conventional, organic, etc.) and storage

▸ Apple usage (vinegar and yeast)

Adopt a Tree

▸ Construction of extended tree network (IoT=Internet of Trees) to support protection and conservation of forests

▸ Green Almighty: Students look at different aspects of plant biology

▸ Voltage is Everywhere: Investigation of voltage and current and what they have to do with plants

▸ Internet of Trees: Building data loggers and sensors to measure environmental parameters

Additional information:
17 goals to transform our schools

▸ Background information for teachers

▸ The 2030 Agenda

▸ The 17 Sustainable Development Goals (SDGs)

▸ Education for Sustainable Development (ESD)

▸ Whole School Approach

▸ ESD competencies for teachers

▸ Good practice

Direct links to the different parts

- 17 goals to transform our schools
  www.science-on-stage.eu/material/17-goals-transform-our-schools

- The 3 Rs and the Products of the Future
  www.science-on-stage.eu/material/3-rs-and-products-future

- Smart Cities
  www.science-on-stage.eu/material/smart-cities

- Climapse
  www.science-on-stage.eu/material/climapse

- CO2MUCH – Think Global, Act Local
  www.science-on-stage.eu/material/co2much-think-global-act-local

- An Apple a Day Keeps the Climate Okay
  www.science-on-stage.eu/material/apple-day-keeps-climate-okay

- Adopt a Tree
  www.science-on-stage.eu/material/adopt-tree

Science on Stage festival 2024

- 12-15 August 2024, Turku, Finland

- 450 STEM teachers (primary to secondary level) from over 30 countries come together to exchange ideas

- Motto: Sustainability in STEM Education

- National preselection in member countries throughout 2023 – teachers can apply via their member country

- Find the application process in your country https://www.science-on-stage.eu/national-events

From teachers for teachers

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