STEM Sustainability Project

Creating classroom content

Today, BBC news

Prince Charles

“nature has just been pushed to the peripheries, we've exploited and dug up and cut down everything as if there was no tomorrow, as if it doesn't matter…

The more we erode the natural world, the more we destroy biodiversity, the more we expose ourselves to this [SARS-CoV-2] kind of danger.”

EU adopts UN Goals for Sustainable Development

Climate Change and Paris Agreement 2016

European Climate Change Programme:

To keep increase in global temperature to less than 2 °C

…from about 1900.

Tackling Sustainability

- Means finding ways to reduce global poverty and raise levels of equity while at the same time keeping climate change in mind.
- ***Some SDGs*** focus on climate change.
- All human activity demands changing energy from one form to another.

  Most SDGs will require an examination of energy sources.

  1. how to use renewable sources of energy
  2. How to reduce reliance on fossil fuels.
- ***All SDGs*** invite the questions

why and *how* the goal is to be reached and so are open to mathematical and scientific investigation.

Where do we, T^3, fit in?

The driving principles for T^3 Europe are

- to bring modern teaching technologies to teachers working in the STEM activities.
- to emphasise methods in STEM activities.
- to consider the impact of STEM upon society.

EDUCATION FOR SUSTAINABLE DEVELOPMENT BEYOND 2019

UNESCO launches Education for Sustainable development 2015-2019.

UNESCO launches a follow up to Education for Sustainable Development.

Education for Sustainable Development:

Towards achieving the SDGs (ESD for 2030)

In ESD 2030

- ESD for the future cannot afford *not* to address the implications of the technological era.
- *ESD for 2030* aims to build a more just and sustainable world through strengthening ESD …
- All ESD activities contribute to the achievement of the SDGs.
- there need to be more opportunities for them [teachers] to increase their capacities to empower learners.

In ESD 2030…in particular

All ESD activities contribute to the achievement of the SDGs. ... among others,

climate change, enshrined in SDG 13 on climate action,

ocean life in SDG 14,

biodiversity in SDG 15 as well as

clean energy in SDG 7,

sustainable cities and communities in SDG 11,

responsible consumption and production in SDG 12,

and education in SDG 4.

Sustainability: through the eyes of a Biologist and in the context of STEM

STEM sustainable development project

To design classroom activities or content with

1. STEM in mind
2. Sustainability in mind

Each activity

1. to reference sustainability goal or goals.
2. to reference STEM subjects applied.
3. to have a fit to the curriculum.

Each submission

Each submission to contain at least a student sheet and a teacher sheet

The student sheet should reference

1. The context of the activity
2. Learning outcomes
3. Experiment/Investigation notes and instructions
4. Questions.

Each submission

Each submission to contain at least a student sheet and a teacher sheet

The teacher sheet should reference

1. Sustainable Development Goals and STEM subjects.
2. Learning outcomes.
3. Overview of the STEM activity
4. Notes on experiment set-up.
5. Activity, tips and ideas for teaching.
    1. Exemplar results to contain screen shots of typical student use.
    2. Answers to all questions including the question itself.
6. Follow up activities, further ideas, links to other activities.

Scope of project

- To add a classroom resource at least every month.
- Resources submitted to Stephan, Christine and Ian for editing.
- Activity to be covered in a typical lesson, 1 to 2 hours.

For example …

- Armando Severino: Estimating the Earth’s Albedo

Completed and ready to go!

- Hans-Martin Hilbig & Veit Berger: Ecological classroom

Looking for editorial support.

- Ian Galloway: Modelling Increase in Rainfall

Looking for additional STEM material.

Project Logistics

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Roll-out plan

- Starting September: 1x /month
- Teacher notes, student sheet, TNS file, etc
- 1x mother language, 1x English
- https://resources.t3europe.eu