GOSTEAM Hands-on Activity Template *(Classroom-Formal)*

## Title:

European environmental statistics

## Short Description (Max 500 words):

What country in Europe lives in the best environmental way?

1. Discussion in groups about what factors/ statistics could reflect a "good" environmental lifestyle (cars/consumption of meat, clothing, electronic /air quality/biodiversity/green infrastructure/roads/garbage/ ... )
2. Get the statistics.
3. Presentation with maps.

## Keywords (Up to 5):

Eurostat, environment, statistics, lifestyle

## Information about the Implementation

Age and language of the students:

| Language: | Age: | 9-12 | 12-15 | 15-18 | 18+ |
|---|---|---|---|---|---|
| | | ☐ | ☐ | ☒ | ☐ |

Number of Lessons – Duration (per lesson):

Number of Lessons: 4 Duration per Lesson: 45 min

Subjects:

For which subject(s) the activity is usable, is it an interdisciplinary activity?

Science ☒

Physics ☐ Chemistry ☐ Biology ☒ Geosciences ☒ Environmental ☒ Other ☐

Technology ☐

Engineering ☐

Arts ☐

Mathematics ☐

## Information about the Scenario

### Curriculum and country:

Link of the current activity to the curriculum: https://www.skolverket.se/undervisning/gymnasieskolan/laroplan-program-och-amnen-i-gymnasieskolan/hitta-program-amnen-och-kurser-i-gymnasieskolan

| Country: | Sweden | Class: | Biologi, Geografi | Grade: | 10-12 |
|---|---|---|---|---|---|

Topic: Environmental statistics

### Objectives (Max 100 words):

Description of the learning objectives

1. Knowledge of different natural and cultural landscapes, their connections, development and change over time, and about connections between people, society and the environment.
2. Ability to analyze conflicts of interest related to natural risks and human activities, as well as how conflicts of interest affect the earth's habitats and human living conditions, from the perspective of sustainable development.

### Materials (Max 100 words):

Which resources and materials (software, hardware) are needed?

computer

### Spatial concepts, skills and abilities:

Which spatial concepts and skills are covered by the activity?

## Spatial concepts:

**Primitives:** Identity/Name ☐ Location ☐ Space/Time ☐

**Simple:** Distance ☐ Direction ☐ Connectivity ☐ Movement ☐

Boundary ☐ Shape/Area ☐ Adjacency ☐

**Difficult:** Overlay ☐ Buffer ☐ Topology ☐ Coordinate ☐

Map ☒ Scale ☐ Shortest Path ☐ Navigation ☐

Surface ☐ Slope/Gradient ☐ Aspect ☐ Contour ☐

**Complex:** Interpolation ☐ Map Projection ☐ Spatial Dependency ☒

**Other:**

## Spatial skills:

- ☒ Map literacy
- ☐ Navigation/orientation
- ☐ Estimating distances and directions
- ☐ Recognizing and understanding patterns/Understand and identify models of spatial organization
- ☐ Select an ideal location based on the given spatial features
- ☒ Visualization
- ☐ Understand and identify spatial correlations/ dependencies
- ☐ Categorize spatial entities/ geographic features and identify hierarchies
- ☐ Compare spatial entities and draw analogies among them
- ☒ Identify/determine connections/relations
- ☐ Understanding scale in space and time
- ☒ Delineation of spatial regions/ zones based on given features/ properties

## Short Description

Navigation/orientation: Finding one's way in unfamiliar environments, interpreting and giving walking and driving directions.
Estimating distances and directions: Measure paths, weighted distances, angles.
Map literacy: Using, interpreting/understanding, learning from, and communicating acquired spatial knowledge from maps, comprehension of geographic features represented as points, lines, or polygons.
Recognizing and understanding patterns/Understand and identify models of spatial organization. Delineation of spatial regions/zones based on given features/properties: Regionalization processes, pattern recognition and clustering identification in the 2d and/or the 3d world.
Select an ideal location based on the given spatial features: Single or multi-criteria siting and optimal areas identification.
Visualization: Visualizing spatial entities from written/oral verbal descriptions, from their 2d or graphical representations or through mental transformations; such as axis rotation or perspective taking.

Understand and identify spatial correlations/ dependencies: The ability to realize, identify and explain patterns, clusters and relevant spatial dependencies.
Categorize spatial entities/geographic features and identify hierarchies: Identify the hierarchical form of data and gradients between spatial entities.
Compare spatial entities and draw analogies among them: Calculate and compare different geometric objects' shapes, area and, boundaries.
Identify/determine connections/relations: The ability to identify links and common characteristics among spatial entities and between humans and spatial entities.
Understanding scale in space and time: The understanding of changes/transitions through space and time for different spatio-temporal scales.

Geospatial concepts and spatial abilities documentation (see Section 3.2):
**http://www.gosteam.eu/wp-content/uploads/2021/05/GOSTEAM_IO1_A1_final.pdf**

## Description of the activity in detail

### Classroom activities

**Lektion 1**: (45 min)

*Lesson 1 requires that students have prior knowledge of sustainable development. If not, it is good if the teacher can explain and exemplify the concept of sustainability a lesson before.*

The teacher introduces and motivates the task, for example by showing a small film clip about our consumption, ecological footprint or something similar.

Tip: On Youtube you can find several good short movies.

| Titel | link | Language and time |
|---|---|---|
| What is sustainability? | https://www.youtube.com/watch?v=zx04Kl8y4dE | English.<br>3 min |
| How to save our planet. | https://www.youtube.com/watch?v=0Puv0Pss33M | English<br>8,5 min |
| 10 years to transform the future of humanity -- or destabilize the planet | https://www.youtube.com/watch?v=8Sl28fkrozE | 17 languages<br>8 min |
| His Epic Message Will Make You Want to Save the World | https://www.youtube.com/watch?v=B-nEYsyRlYo | English<br>4,5 min |
| Why 50 years of UNEP shows it's possible to save the planet. | https://www.youtube.com/watch?v=GvqzuhKSg_8&list=RDCMUC9V3x9HelwEk3Z6EknB_1Cg&index=24 | English<br>2,5 min |

Students will discuss in groups how lifestyle can affect the environment, for example through how we consume goods.

1. Write down the most important factors in the lifestyle that affect the environment.
2. Give suggestions on what measurements could serve in comparing the environmental impact of different countries.

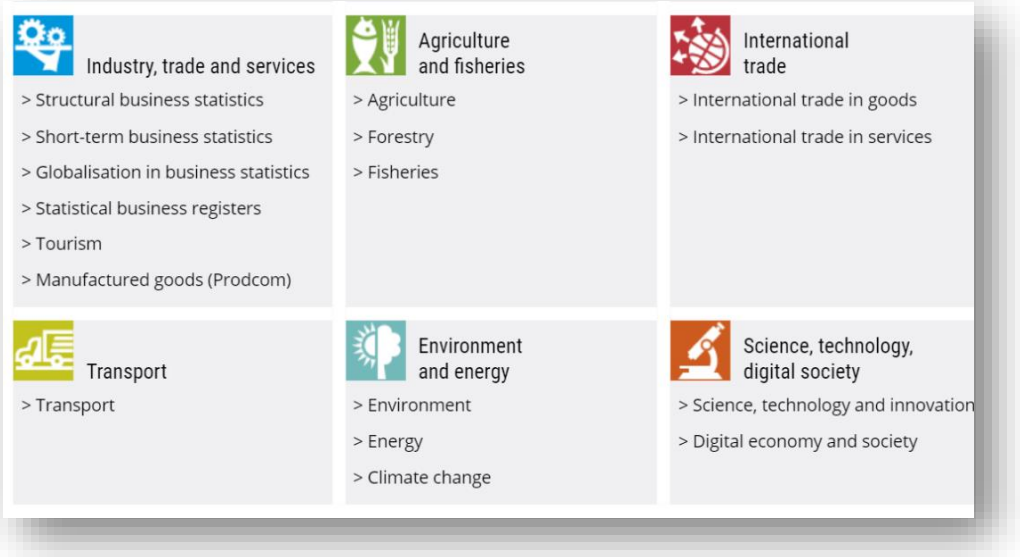
The lesson ends with the teacher collecting the groups' suggestions on the board.

**Lesson 2**: (45min)

The teacher starts the lesson by showing the summary from the last lesson's suggestions.

Next, the teacher shows how to search in the website of Eurostat to find environmental statistics.

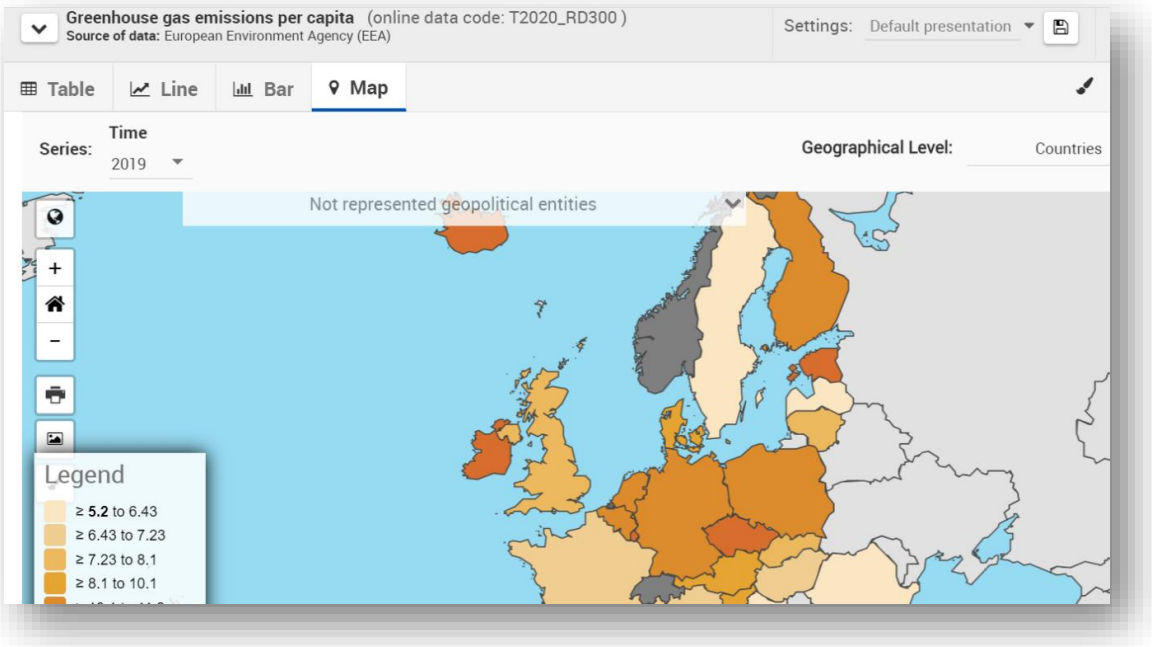
https://ec.europa.eu/eurostat/web/main/data/browse-statistics-by-theme




Students will then have to find relevant environmental statistics:

1. Based on how a certain lifestyle factor affects the environment.
2. Which measurements that can reflect the environmental impact.

*Example: High meat consumption produces high emissions of methane. By seeking out "Greenhouse gas emissions per capita" in the Eurostat database, you can then choose how to present the data; table, line, bar, or map. Students have to think carefully about their choice of tables, because there are many tables, and you may not be able to choose both the emission source of methane and the emissions per capita.*




The group should justify their choices, how the different countries relate to each other, and what possible reasons there may be for high or low values in certain countries. It is important that the group continuously writes down their results, for example in a PowerPoint.

## Lesson 3: (45 min). Preparation for a presentation

For the presentation, students must:

1. Explain and justify their selection of factors they have chosen to look at.
2. Use the maps actively when reporting. (Explain coloring, the selection you have made, and which countries are represented on the map.)
3. What possible reasons may be for some countries to be lower or higher in the statistics.
4. Propose solutions to improve the environment for all countries. What success factors may have existed in the different countries?

## Lesson 4 (45 min) Presentation

1. The groups will present their results to the class.

2. Everyone in the group must be active in the presentation.
3. After each presentation, there will be a short time for question.

Online activities

Description of activities for distance learning in home-schooling

## Sustainable contact:

| Name & email |
| --- |

## References (if any):

## Assessment (if any):