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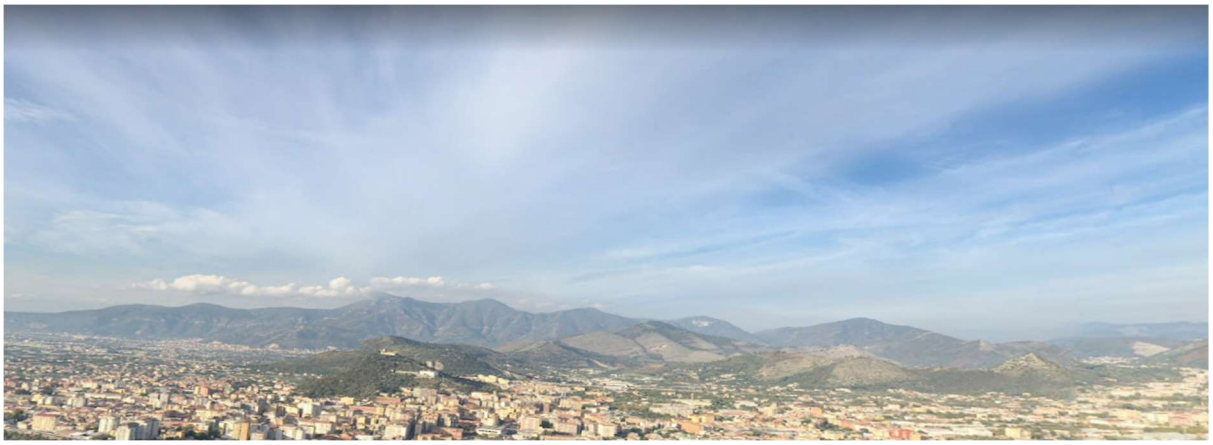
INVESTIGATION - LEARNING MODULE

Climate change: It's Time for Action!!!



Campania Landscape (Italy)

Introduction

There aren't many qualities that are true of all life on Earth, but the need for water is one of them. It's in all living things, whether they live at the bottom of the ocean or the driest desert. Water made life possible on Earth. Even astrobiologists (scientists who search for life on other planets) think our best bet for finding life is to search for water. This Unit will be focusing on how climate change and anthropogenic interventions affect the state of "health" of the waterways in our local area: It represents an attempt to investigate and evaluate through the determination of the EBI (Extended Biotic Index). Once Waterways were, certainly, the characteristic elements of a landscape, decisive for its economic and social development. Today they are often perceived only in a negative sense for their impact on the quality of the environment where communities live. This activity aims to raise students' attention and interest, even local Citizens', who are often unaware of their importance, by proposing an active and documented investigation of the naturalistic aspects of waterways, so that the desire to "be in charge of them" can arise.

The investigation can be implemented by following these steps:

1) **Planning**
   In Planning, students and teachers design their investigation activities on landscape, for instance they decide what to do, how to do it, when to do it, where to do it.
   According to the topic or issue chosen for investigation, the class will need to identify what kind of actions to undertake in terms of literature review, hands-on research activities, and it will identify the most suitable methods and list the needed materials to gather the necessary information.
   Expert stakeholders from local research centres, universities and local authorities can be contacted as a valuable opportunity to access up-to-date knowledge and to make use of scientific equipment.

2) **Performing**

In Performing the investigation, the class implements the devised plan, and follows the steps of action along the project timeline. Data collection can regard environmental data during a field trip, a survey on the perceptions and views of the local community, or investigations on historical and artistic documents regarding the landscape of interest. Specific materials, equipment and worksheets can be used, allowing students to approach methods and software of common use in research. Experiments can be performed to understand the reason for certain phenomena.

3) **Data analysis and interpretation**

In Data analysis and interpretation, the collected data are analysed and interpreted in order to understand the extent of the issue (generating new knowledge) and the relations between the factors and variables that are involved in the investigation.

Objectives of the Investigation

LOTS-RELATED

- ✔ Finding the relationships between the variables investigated;
- ✔ Recognizing and identify the causes of alternative phenomena in progress;
- ✔ Encouraging teamwork and collaboration between students;
- ✔ Introducing the European Landscape Convention and the definition of Landscape;
- ✔ Being aware of the European Landscape Convention;
- ✔ Understanding the three fundamental components of the European Landscape Convention (protection, management and planning);
- ✔ Becoming aware that the implementation of the European Landscape Convention is a duty and a right of all European Citizens;
- ✔ Enabling students to understand the causes of the challenges of the selected landscapes;
- ✔ Understanding in depth what has been learned;
- ✔ Acquiring and using terminology appropriate to the investigation context.

HOTS – RELATED

- ✔ Encouraging Critical Thinking;
- ✔ Proposing/Creating solutions based on the knowledge acquired;
- ✔ Summarizing the knowledge acquired in a document, such as a presentation / poster, a PPT or Prezi;
- ✔ Communicating the results to the general public.
- ✔ Planning a scientific experiment;
- ✔ Debating through the various phases of the Learning Unit;
- ✔ Using a data management software;
- ✔ Carrying out a graphic representation of the territory.

HOW TO INVESTIGATE

When: After the Conceptualization Phase (Step 2)
Time estimated: 5 teaching hours in classroom 4 and fieldwork
Where the activity takes place: in the classroom and outdoors
Method (how the students have to work): group-work and individually
Equipment for taking samples and for measurements in the field: Thermometer, PH Meter, Bottles with caps, Vials, Magnifying Glasses.

Art activity - in every step of investigation students are invited to produce an artistic product inspired by their investigations: texts, photos, drawing, videos, music or sound, meme (https://en.wikipedia.org/wiki/Meme), patchwork/collage, theatrical performances.

In the classroom, the students are divided in groups. The teacher/facilitator could follow the steps suggested in the table below:

Planning	Brainstorming. Group work, PPT presentation. Carrying out a Google module or a video game with the Kahoot! App, to check the knowledge and full understanding of the activities to be carried out.

Performing	Fieldwork. Inspection of the selected stretch of the watercourse with cameras and mobile phones with internet connection. students will be guided in their observation of phenomena related to water in landscape and will take samples and for measurements in the field. **Scientific activities:** Observation of the place with photos, detection of odors, description of the flora and fauna by filling in the monitoring forms prepared in the previous phase, sampling and measurement activities. **Artists**: Students focus their research on the following areas: Photography, Cinema, Augmented Reality application for mobile.

Data analysis and interpretation	Students are invited to develop monitoring worksheets about data to be detected, measured and recorded during the exploration of the sites. The data collected will be used to assess the “health” of the watercourse by determining the EBI and some chemical-physical parameters (temperature, pH, oxidation of the water samples, nitrates). All data can be analyzed and discussed with stakeholders to highlight their relations to current local circumstances in terms of the social, historical and artistic context. Students will discuss the experiences they have gained during the investigation: the problems they encountered, the questions they could not answer, etc. Finally, they discuss what a water landscape means and, in general, how important it is to protect our environment. The students organise videos and photos to upload onto Siftr Platform.