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A trip through the soil to raise public awareness

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Since its creation in 2015 on the occasion of the International Year of Soils, a workshop for primary school pupils and the general public has regularly taken place at the University of Lorraine (in the city of Metz, France), except for the last two years due to the pandemic. It enabled the visitors to discover the major issues of soil knowledge and the students involved in this project to appropriate these questions.

A trip through the soil to raise public awareness

Created specifically for the International Year of Soil, a pedagogical project focused on soil sciences has been developed by the University of Lorraine. The aim of this project is to elaborate an educational activity about soils, through observations and experiments designed for a young audience and for a general public.

Therefore, the authors and students from bachelor to master levels have jointly developed this workshop and make it evolve every year. Students had thus the opportunity to practice and improve their learning in soil sciences, and also to debate about teaching methods and sharing their knowledge with different people. This kind of active learning is regarded as one of the effective educational methods (Filed *et al.*, 2011).

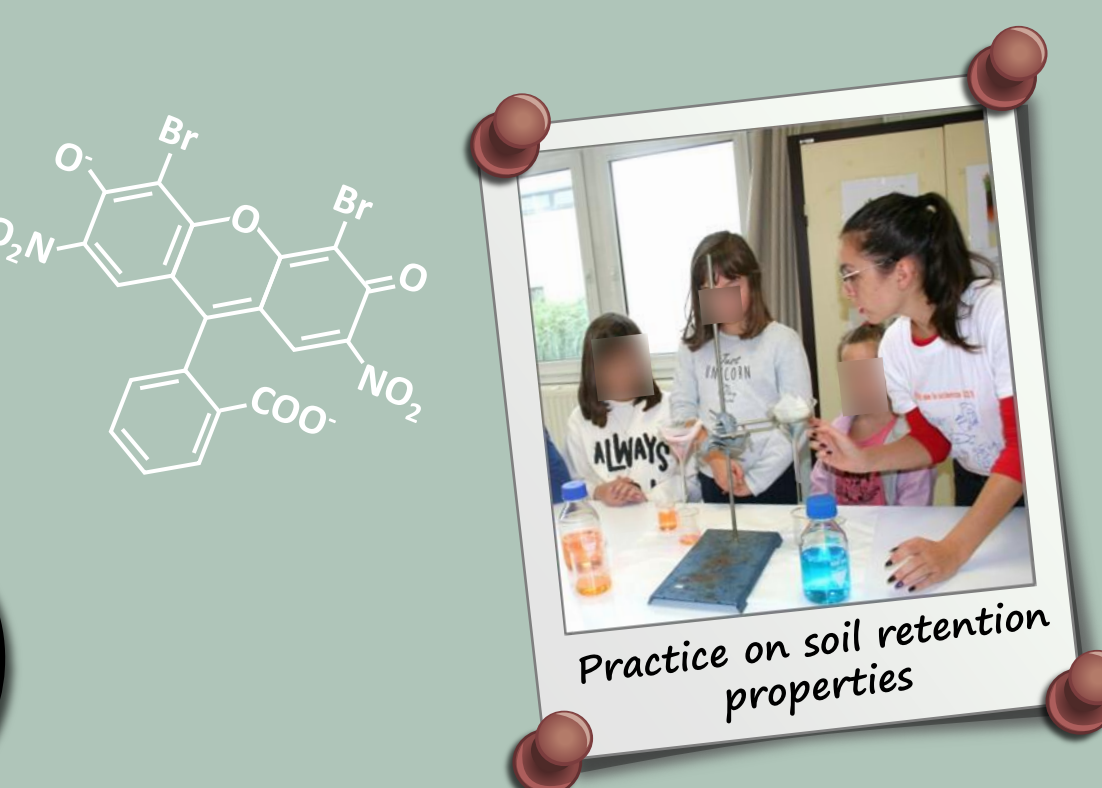
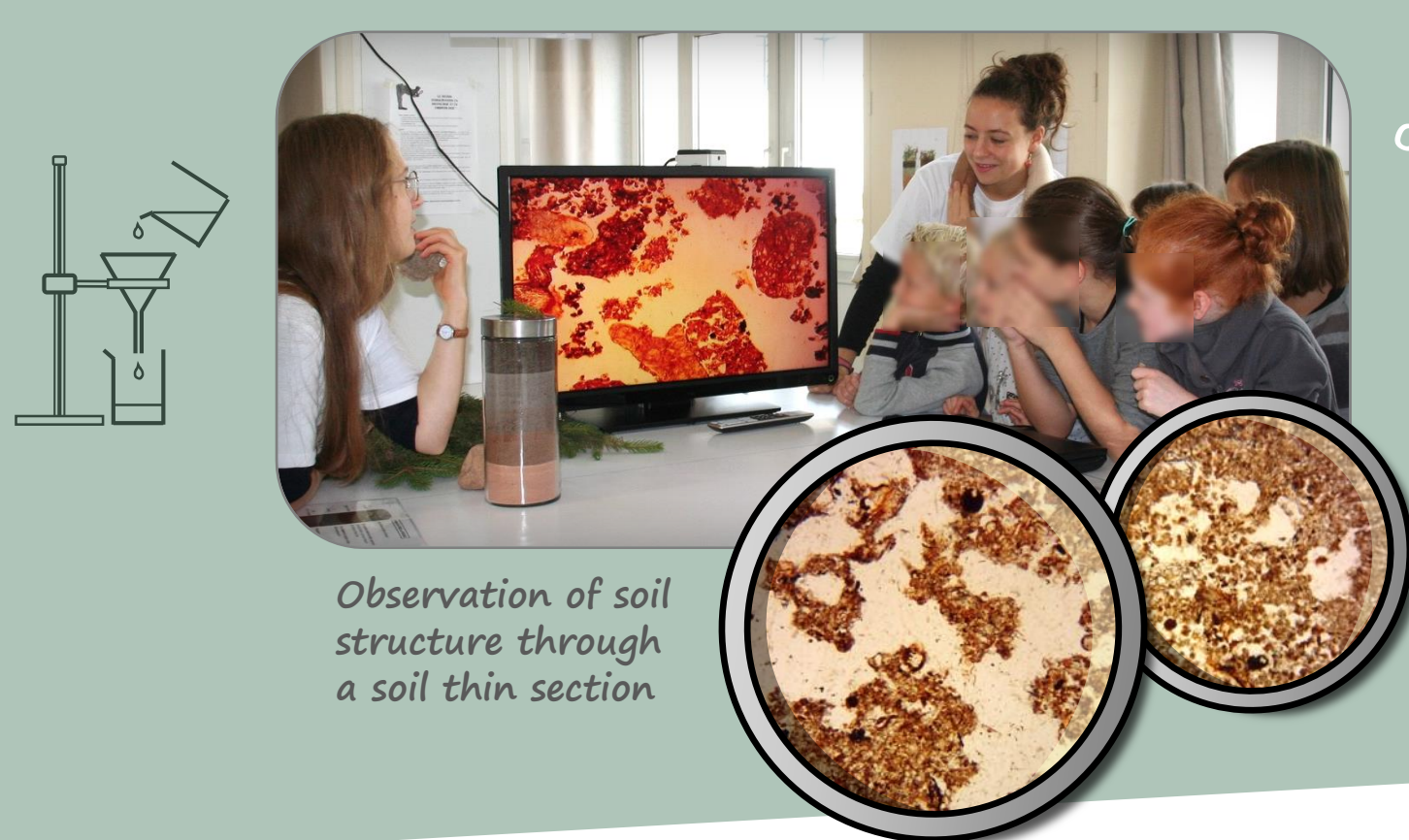
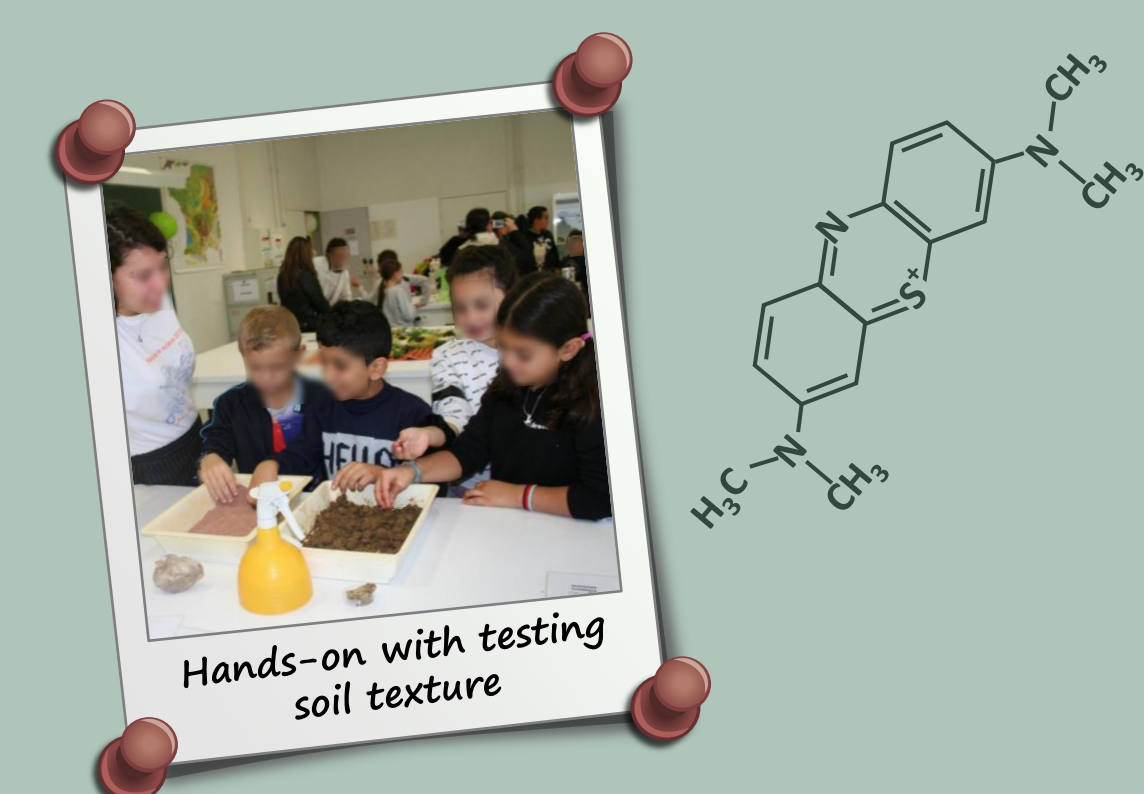
This trip through the soil is structured in 4 parts: the students guide the public between the different activities described hereafter.

What is the soil made of?

Here the organization and constituents of soils are approached in order to show the great diversity of soils and their essential properties.

Participants can touch different types of soil texture in order to compare them, they can also perform the HCl test, as well as manipulation using eosin and methylene blue. These experiments enable the concepts of soil constituents, parent-material, exchange and retention properties to be addressed.

Finally, the observation of the organization of the soil at different scales provides an opportunity to evoke the notions of structure, aggregation, porosity and water circulation.



What are human uses & impacts on the soil?

A final activity is based on a carpet representing the different types of land use: urban, forest, agricultural, etc. Small objects are placed on top, representing the services provided by the soil (toy vegetables, tractor, pieces of wood, etc.) or the dangers that threaten it (plastic waste, model of a building, etc.).

A discussion takes place with the participants to identify these services and threats. Then they place a label with a green circle (services) or a red triangle (threat) near to the involved place.

The activity ends with a discussion on the simple things that everyone can do to protect soils (avoid using pesticides in the garden, do not throw waste into the environment, etc.).



What is soil?

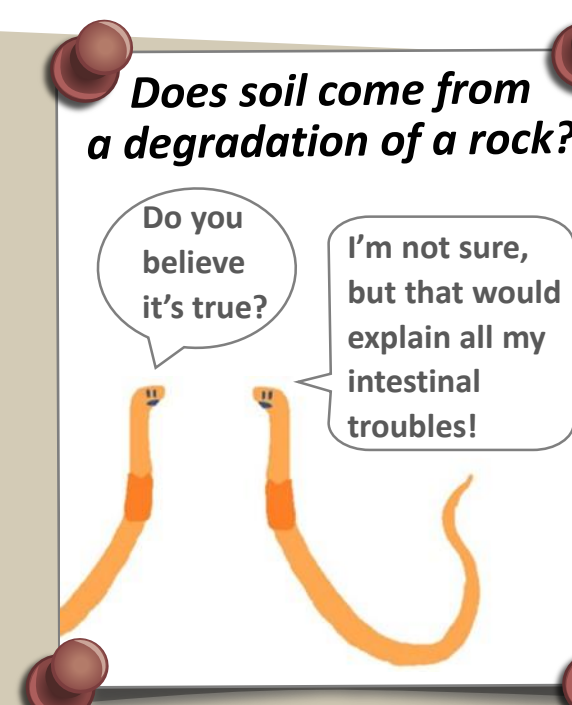
The first activity aims to get pupils/public thinking about a definition of what we call "soil".

Through open questions, they are encouraged to discuss what the word "soil" means to them: "the soil of my grandfather's garden", "the classroom floor", "the ground of the planet Mars!" (in French, all these concepts are called "sol").

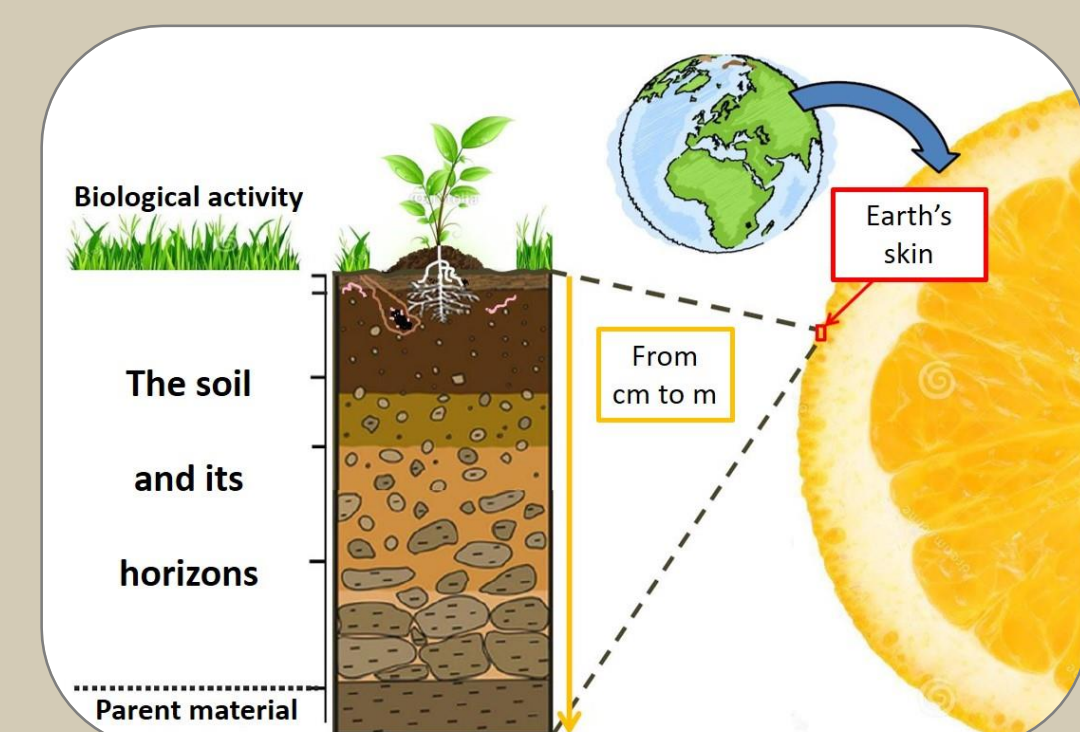
The different proposals are discussed with the students supervising this activity (and the authors supervising the students) and a definition of soil is proposed by using little posters or drawings.

Particular attention is paid to the origin of the soils, their formation, their organization into horizons.

To explain briefly what are the delimitations of the soil, a comparison is made with the skin of an orange



"Worm stories" is always a favorite among the visitors

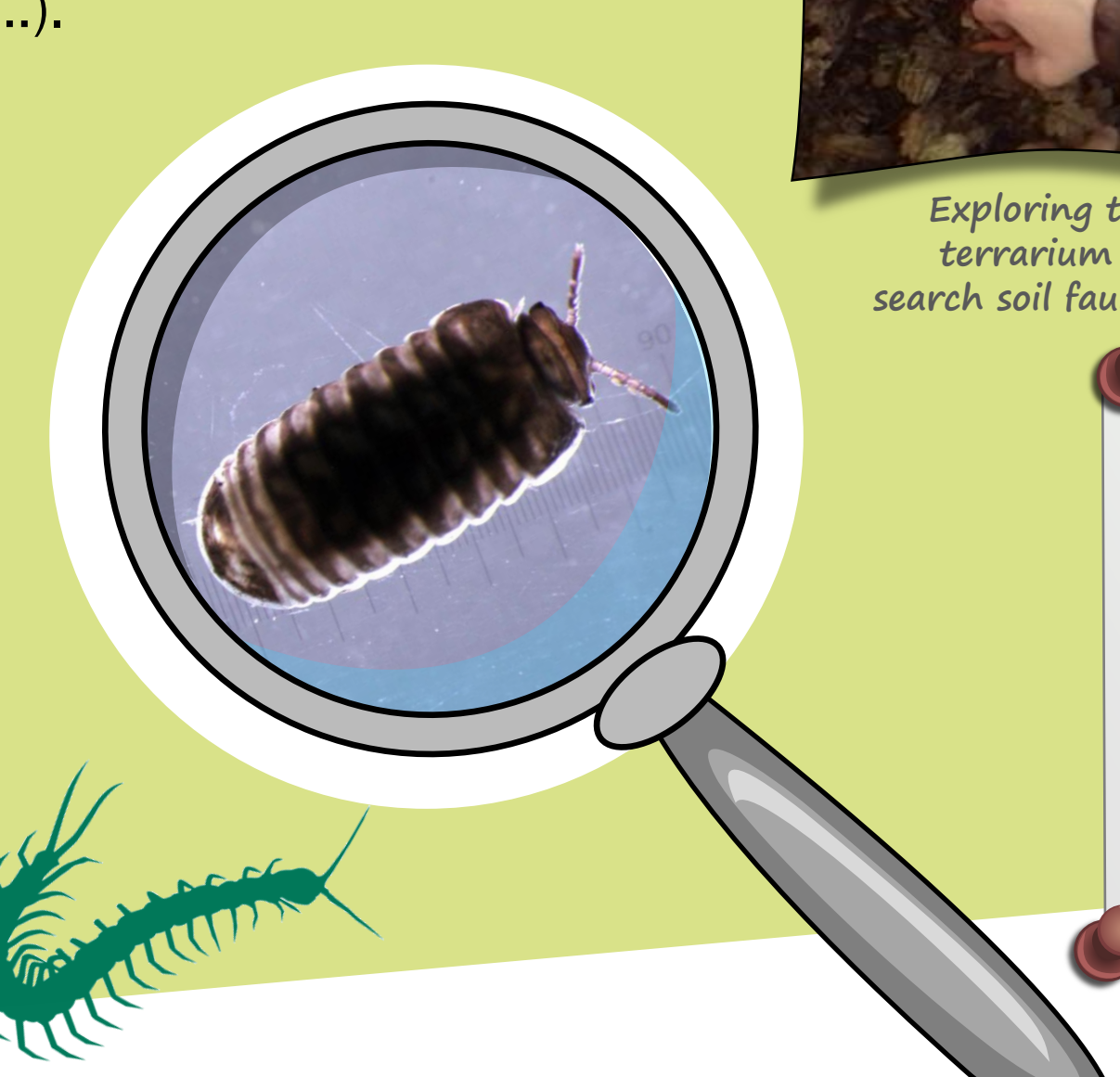


What is soil biodiversity?

Another activity focuses on soil biology and ecology through the use of a terrarium containing soil, litter and soil fauna.

The pupils can thus directly go in search of the inhabitants of the soil: woodlice, millipedes and other bugs. They can also observe their morphological details with binocular loupes.

These observations allow to discuss biotic interactions (who eats who? ...) and the role of these organisms in the soil functioning (organic matter recycling ...).



This workshop, led by authors and students from the University of Lorraine, has been experienced by over 700 pupils from schools since its creation. It allowed the young public to discover and manipulate soils in a playful way. It was also an opportunity to show their teachers many educational activities that can be carried out in soil sciences.

This workshop is also open to the general public (about 300 visitors) to raise awareness of the importance of soil conservation. In addition, the involvement of bachelor's and master's students in the creation and management of this workshop enables them to better integrate the major issues in soil sciences.

