CURIOSOIL

Awakening Soil Curiosity to Catalyse Soil Literacy

Guidelines for proposing and designing Soil Curiosity Kit activities

The Soil Curiosity Kit describes **soil literacy activities that can be integrated into a wide variety of formal, non-formal and non-formal education contexts, using accessible materials and without the need for additional knowledge on the part of educators and facilitators.** The activities are aimed at groups of 5 to 30 participants, which can include families or groups of friends. Some activities can be adapted for individual use.

The following sections aim to describe the methodologies and activity suggestions in an inspiring rather than prescriptive way. The Soil Curiosity Kit concept has already been presented at the CoP meeting on 6 June 2025, and adapted and extended excerpts from this deliverable will be used to launch the co-creation and pilot project design process, which will eventually result in the collection of publicly available activities to be submitted as the **Final Version in Month 37 (February 2027).**

Preliminary versions of the activities can be proposed/ made available via the CURIOSOIL website, at events and workshops, through specific training or materials (brochures, summaries of educational practices, etc.).

Some general recommendations:

- Emphasise connections and relationships with other subjects and disciplines: Identify synergies with existing school subjects and extracurricular activities in formal education and with lifelong learning, community groups and organisations. For example, community energisation and education, facilitation and team building.
- Encourage direct interaction with soil and soil materials, as well as real-life interaction and socialisation among participants. Prioritise on-site activities, supported by online activities and digital media.
- Implement a multi-sensorial, inclusive approach: involve as many senses as possible to enhance the learning experience and increase the inclusivity of activities for participants with sensory and functional diversity.
- Create metaphors that refer to concepts on the ground: represented as objects, integrated into the mechanics of the game, incorporated into gestures and choreography, told as stories.

CURIOSOIL

Funded by the European Union

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

Type of activities

For the purposes of co-creation, pilot projects and eventual publication of the activities, we propose 5 types of interrelated and non-exclusive activities:

1. Observation exercises and experiments.
2. Games and toys.
3. Crafts and arts.
4. Movement, dance, performance and theatre.
5. Stories, debates and literary exercises.

OBSERVATION EXERCISES AND EXPERIMENTS

Key actions: Observe, measure, record.

Use in the classroom - can be integrated into science lessons and study visits.

Direct observation of soils and landscapes is the basis of soil literacy and soil science.

There are many simple tests and experiments that can be carried out outdoors or using collected samples. Although these tests cannot replace professional laboratory analysis to rule out pollution or assess nutrient levels for example, they can provide important information about the soil and support the management of community and school gardens. This type of activity is directly linked to scientific themes in formal education. Outdoor observation exercises can be integrated into school trips and holiday camps. Outside of classroom activities, soil observation exercises can be offered to groups of hikers and are a good opportunity to connect with lifelong learning and citizen science.

One of the simplest experiments consists of mixing a soil sample with water in a transparent jar and letting it sit for several hours so that the materials settle in layers: sand at the bottom, followed by silt and clay, with organic matter floating on top. This simple test, carried out with the right methodology and enough samples, can, for example, provide information on how the soil changes as you move away from a river or down the side of a mountain. We will develop some experiments specifically for the Fábrica – Science centre of Aveiro.

Other examples suggested by ISRIC are the preservation of soil profiles as "mini soil monoliths", such as those collected by the Soil Museum, and the practice of "Worm Charming", which consists of vibrating the soil to attract earthworms to the surface. This technique, which has traditionally been used to hunt earthworms for fish bait, can be used for recreational and scientific purposes, and there is an annual competition held in Wageningen and in the UK.

CURIOSOIL

Funded by
the European Union

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
**State Secretariat for Education,
Research and Innovation SERI**

Instructions for making mini-monoliths/profiles: https://www.nrcs.usda.gov/resources/education-and-teaching-materials/a-soil-profile

The observation exercises and experiments will involve recording and visualising data (soil profiles, maps, graphs, etc.), which relates to different arts, namely drawing and photography. There are already several applications to help identify soil and record geospatial data, and we hope to further explore the use of digital tools for soil observation at the 2026 Hackathon, in Aveiro.

GAMES AND TOYS

Key actions: Play!

Use in the classroom: especially attractive for primary school (6-12 years), but not exclusively.

PROPOSALS AND CHALLENGES:

Playing directly with soil and soil-related materials is an excellent activity for children and adults, and it is important to provide safe and healthy environments for playing with soil, which in many urban areas are reduced to sandboxes. A classic game for children is to prepare small "cakes" (or other fictitious foods) from the available mud.

We also suggest a series of games and toys to complement and enhance direct interaction with the soil. Different crafts and materials can be used to design new toys or adapted from available elements, such as wooden moulds. One possibility we'd like to suggest is repurposing existing toys, such as a toy farm or Montessori carrot games, using stickers (for example, representing different soil animals).

Soil-related concepts can be represented by different objects and integrated into the mechanics of different games, from complex Serious Games to simplified board games that can nevertheless give an idea of how some soil-related processes work.

Creating completely new games that are engaging and playable is a difficult task, so we suggest adapting the mechanics of existing classic games with soil-related content:

Memory and matching games in which participants must find the pairs by discovering and remembering the images printed on one side of the game pieces. The pairs can be made up of identical or related images, which must be clearly identified by a coloured dot or other means.

These games are adaptable to all ages and levels of difficulty. The pairs can be designed with many interesting concepts, such as the links between soil and landscape and between soil and food. The Soil Image Wiki (described in section X.X) already contains many suitable images.

Board games usually need more props, such as pieces, dice and cards, but the main element is the board itself. Players need to advance through a mixture of strategic decisions, luck and sometimes exchanges with other players.

CURIOSOIL

Funded by
the European Union

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Education,
Research and Innovation SERI

For soil education, classics such as "Juego de la oca" or its counterpart "Snakes and Ladders" can be easily adapted to soil-related content. Mission Soils itself can be represented as a board game in which the goal is soil health, and a series of levers and barriers to soil health are represented on the board as "ladders" or "snakes", respectively.

Card games

Many card games involve players earning points through specific combinations of cards, as well as specific ways of exchanging or even stealing cards from other players. For a CURIOSOIL card game, we are exploring ways of reusing the NBSOIL Vision Cards, which already included many useful categories, such as soil threats, soil mission objectives, soil sectors, soil ecosystem services...

https://nbsoil.eu/visioning-cards/

There are other types of card and board games that involve role-playing and storytelling, such as "Magic the Gathering" and "Dixit", which can also be a source of inspiration. The basic idea of Dixit is to tell stories and associate words based on images.

CRAFTS AND ARTS

Key actions: Make!

Use in the classroom: art and technology lessons.

The CURIOSOIL consortium has already explored the artistic possibilities of soil materials in the first multisensory workshop (see section 3.4) and during the first Artathon session in Wageningen (NL) on 5 June 2025. Artathons and Interactive Exhibitions will continue to explore how to express and represent the soil through artistic means.

In fine arts and crafts, soil is both a source of inspiration and a source of artistic materials (namely different types of clays and pigments).

Natural soil and materials derived from soil can be directly used to create art pieces. Commercially available soil pigments were trialled in the first Multisensory Workshop and the first Artathon session. Clay is an essential modelling material, which can be used on its own to model fauna and soil profiles, or combined with organic materials and fibres and other soil-related materials such as sand, rocks and even mineral crystals to create more ambitious landscape models and mixed media sculptures.

Landscape art and outdoor activities and installations that use locally collected natural materials that would otherwise be part of soil waste are especially interesting, but they must be carefully planned and monitored so as not to disturb the local fauna and flora.

Other natural materials, such as natural fibres and in particular raw wool, which is mostly treated as waste in the EU. Natural fibre threads and ropes can be used to represent links, roots, hyphae...

CURIOSOIL

Funded by
the European Union

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
**State Secretariat for Education,
Research and Innovation SERI**

Vegetables and other food ingredients can be used in many creative ways, also for painting and modelling, creating non-toxic and edible pieces, for example soil animals and landscapes built with food.

Some dishes, such as lasagne and desserts, are built with layers of different composition and colour, just like soil profiles.

Recycled and reused materials, such as cardboard for painting and old clothes to be adapted into costumes, and many other elements that can be transformed into soil-related art pieces and elements for the games and performance activities described in other sections.

Socks are a common and versatile element that can easily be transformed into soil puppets representing earthworms, nematodes, moles and other soil fauna.

Inexpensive, commercially available elements can be adapted. Blank pieces of wood and plaster that can be painted or modified with printed stickers as elements of toys and games - namely for puzzles, word games, dice, peg dolls, among others.

Finally, craft and artistic techniques can also be used to create devices for direct observation of soils and experiments (for example, a colour chart, a marked jar for separating materials, a suction pot for collecting and observing ants and other soil fauna...).

MOVEMENT, DANCE, PERFORMANCE, THEATRE...

Key action: move!

Use in the classroom: Physical education and psychomotor exercises.

Special activities such as theatre.

The ground is the stable base of our lives, where we walk and build our houses, but it is also full of movement at different spatial and temporal levels.

Activities that involve the whole body have the potential to awaken all the other senses, express emotions and connect participants. Direct contact with nature through outdoor activities is recommended, where participants can safely walk barefoot, dance on the grass or utilise the landscape's features as part of their exercise or performance. Indoor spaces can be enhanced by music and real sounds from the ground (section X-X of the Sound Bank).

In the same way that soil-related concepts can be integrated into game mechanics, different gestures and movements can be used to visualise and represent soil functions and ecosystem processes. For example, a simple choreography can be constructed by proposing movements that represent different soil animals: waving like an earthworm, moving your arms with force like a mole digging a tunnel, jumping like a springtail, walking energetically like an ant... other gestures and movements can represent roots or mycelium growing in the soil.

CURIOSOIL

Funded by
the European Union

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Education,
Research and Innovation SERI

Raindrops falling to the ground, or the movement of water in the soil and up through the roots, can also be translated into simple movements and choreographies.

Contact and interaction between participants are another powerful way of incorporating and interpreting soil metaphors, when managed safely and confidently. Fortunately, there are many resources available in Contact Interaction communities, from fingers lightly touching to participants guiding or supporting each other, or group dynamics such as participants coming closer together, "compacted", being eroded by water or wind... or opening, grouping into clusters.

This use of embodied metaphors for soil literacy will be explored in a workshop to be held and offered by Gaia Education at the Global Ecovillage Meeting in August 2025.

The combination of language, dialogue and songs with movement can be done through theatrical improvisation exercises to more ambitious projects such as the creation of a musical show. This requires props such as masks, costumes and stage decorations, which can be created through other craft and artistic activities.

Guided visualisations are an evocative way of combining a text with movement and breathing exercises, effectively incorporating metaphors and creating an immersive experience.

Movement and dance overlap with different games that utilise the interior space or integrate certain movements as part of the game mechanics.

STORIES, DEBATES AND LITERARY EXERCISES

Key actions: Talking and writing, telling a story!

Use in the classroom: emphasise soil-related content in existing subjects.

This section presents suggestions and tools for activities in which words and language play a central role:

Storytelling is a powerful way to engage all ages, starting with the youngest children. It can be enhanced by using elements such as puppets (for example, finger puppets or sock puppets, as described in the Crafts and Arts section).

Suggestion:

Storytelling in collaboration with games:

- "Exquisite corpse", in which the participants follow the last line of the previous paragraph.
- "Broken phone", in which a word is whispered from one participant to another, and the result is usually very different from the original word, which can be a comical way of commenting on terms related to the ground.

CURIOSOIL

Funded by
the European Union

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Education,
Research and Innovation SERI

Reading and interpreting soil-related data and information: oral presentations, essays and debates play an increasingly important role in secondary education and there are countless opportunities to explore the importance of soil in history and the economy.

Activities can also be poetic and reflective, commenting on or feeding into literary texts and stories. In addition to non-formal education, texts from soil-related books can be proposed to libraries, which host activities such as reading clubs or writing workshops.

Suggestion:

Describe different soils by adopting the "voice" of different soil professionals, stakeholders and decision-makers (such as soil scientists, a migrant worker on a large commercial farm, a small traditional farmer, an indigenous land manager, an urban planner, a conservationist...). This exercise can also serve as a starting point for a role play, a serious game that explores different scenarios and adopts the hypothetical point of view of different actors.

Cross-cutting themes

There are some themes with a notable potential to link the activities in the Soil Curiosity Kit to existing scientific, educational, artistic and cultural concepts. During the co-creation process, we will also highlight possible connections with the overarching categories and subcategories of CURIOSOIL's Soil Literacy Assessment Framework (SLAF), which will also be indicated in the information for each activity.

FROM SOIL TO LANDSCAPE - SOIL PROFILES AND THE LANDSCAPES THEY SUPPORT

The link between iconic, easily recognisable landscapes and the soils that support them is not always obvious, offering great potential for activities at different levels, from a simple matchmaking game to a physical 3D model built or an augmented reality game.

The recent report "The State of the Soils in Europe" contains a brief regional overview of soils in Europe, which partially mentions landscapes and land uses: The State of the Soils in Europe - ESDAC - European Commission

UNDERGROUND LIFE - SOIL BIODIVERSITY AND THE SOIL FOOD WEB

This theme emphasises the diversity of life forms that spend part or all their life cycle in the soil and the multiple links between them. It is so vast that it would be necessary to identify some sub-themes, for example:

- A specific look at soil fauna beyond the iconic and well-known earthworm. From the funniest, such as the mole, to those that some people find frightening, such as spiders and myriapods.

CURIOSOIL

Funded by
the European Union

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Education,
Research and Innovation SERI

- The rhizosphere and all the connections involved is a fascinating concept. Roots, fungi and their networked interaction can, for example, be represented with different ropes and threads.

SOIL MAGIC - SOIL IN FANTASY, FOLKLORE AND MYTHOLOGY

This theme can link soil to literature and culture, from ancient traditions to modern cultural products, as many characters in fantasy and folklore are linked to soil: Scandinavian trolls, Dutch kabouters, "The story of the root-children" by Sibilly von Olfers, the hobbits from the "Lord of the Rings" series, vampires and zombies that come out of their graves, among others.

Conclusions

These resources, and activities, aim to fulfil CURIOSOIL's mission "to promote soil education throughout society" by reaching out to a wide range of groups and communities, playing a flexible, synergistic and complementary role to the more formal, curriculum-oriented materials and online courses developed in WP2, and to the Interactive Exhibitions, which target larger groups and public spaces.

It may be useful to think of the final version of the **Soil Curiosity Kit** as a "recipe book" drawn from a wide variety of sources, edited into a useful format and presented along with samples of "ingredients" (the multimedia resources) so that users can follow the recipes, adapt them to their needs and preferences or develop their own. The goal is to bring curiosity about soil and the motivation to care for it wherever people learn, socialise and create.

CURIOSOIL

Funded by
the European Union

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
**State Secretariat for Education,
Research and Innovation SERI**