



LIVING SOIL

Duration	Age	Difficulty
90 min	15-16	Medium
#EXPERIMENTATION #SCIENCE		

DESCRIPTION

This activity invites students to analyse and classify different types of soil using soil moisture sensors and TI graphing calculators. Students will investigate how soil properties affect water retention and relate this environmental sustainability. The activity also promotes reflection on conservation strategies and encourages the integration of artistic expression and gender visibility in STEAM.

Throughout the activity, students will explore:

- Environmental Sustainability and Soil Preservation
- Critical and Computing Thinking
- Data Collection and Visualization

Students will understand how different soil types retain water and propose real-world actions to improve soil quality and sustainability.

ACTIVITY OBJECTIVES

- Measure and compare soil moisture using sensors and graphing calculators.
- Analyze environmental consequences of soil degradation.
- Relate sustainable practices to soil and water conservation.
- Present data using digital tools and artistic visualizations.
- Promote inclusive participation and highlight contributions of women in STEAM.

KEY COMPETENCES (EU)

- Literacy competence
- Science competence
- Digital competence
- Citizenship competence



MATERIALS



Activity Kit



Calculator



Different types of Soil
(forest, humus-rich,
garden, sandy
or dry)



[Downloadable
Elements](#)

- Provided by students
- Provided by the teacher/institution
- Downloadable Elements

PREVIOUS PREPARATION

- Prepare soil samples and distribute them in labeled containers.
- Print soil recording sheets.
- Display images of degraded vs. healthy soils
- Assign pre-reading or video about environmental soil conservation.

CONTEXTUALIZATION AND ADAPTATION

Start by asking: "Do you know what kind of soil is under your feet?"

Show images of degraded vs. healthy soils. Present the importance of soil in water retention and food systems. Introduce the sensor tool and how it will be used to measure moisture.

Inclusion and Representation: Present the work of women such as Wangari Maathai, Priscilla Baker, or local scientists engaged in soil environmental preservation. Highlight their contributions and inspire students to see themselves as future stewards of the environment.

Complementary tools :

(Downloadable resources (guides, templates, reference examples); Soil moisture recording sheet-template; Example infographics for data visualization; Female scientist profiles (Wangari Maathai, Priscilla Baker)

Classroom activity

- **Environmental Discussion:**
 - Encourage students to reflect and discuss by responding to guiding questions such as:
 - *What would happen to these soils during a heavy rain?*
 - *Which would be most vulnerable to erosion?*
 - *How can we improve the soil's ability to retain water?*
- **Conclusion with Action Proposal:**
 - Each group should present a concrete and realistic action to help protect soil, such as:
 - Creating ground cover
 - Starting a composting project
 - Planting a school garden with efficient irrigation"



Watch video 🎥 - "Digging into SOIL CONSERVATION"

<https://www.youtube.com/watch?v=WHtqOMvSiQc>



Note for the teacher 📝

Extension ideas:

- Create a video documenting the full experiment
- Research soil use in indigenous practices
- Build a prototype of a water-saving garden
- Represent with a visual model how an Indigenous community distributes water or protects the soil using leaves, stones, or natural geometry.

ACTIVITY

Proceed with the following these steps:

- **Soil Preparation and Initial Measurement**

- Groups , gender balanced, set up containers with different types of soil.
- Insert the sensor and take the 1st moisture reading (dry soil).
- Record the data on the calculator.

- **Rain Simulation**

- Add the same amount of water to each container.
- Take new readings at 5 and 10 minutes
- Record the values.

- **Data Analysis**

- Use the calculator to create tables and graphs.
- Observe which soil retains more water and compare group results.
- Design infographics representing data.
- Compare results across groups
- Compare results across groups

- **Environmental Discussion**

- Reflect on erosion, retention, and improvements
- Discuss real-world implications of the findings
- Conclusion and Action Proposal
- Propose a concrete action (e.g., composting, ground cover)
- Create a visual or digital poster to present the proposal



Have a look at these resources :

Students are expected to conduct prior research on selected topics related to the investigation. The following are suggested themes that may be included in their research.

Physical and Chemical Properties

- What are the main characteristics of clay, sandy, and loamy soils?
- How does soil pH vary in different areas and how does it affect plant growth?
- How does soil color influence temperature and water retention?

Water Retention Capacity

- Which type of soil retains the most water, and why?
- How does soil compaction affect water infiltration?
- What is the relationship between soil texture and drainage?

Soil and Sustainable Agriculture

- Which soil types are best for growing different crops?
- How does composting change the properties of soil?
- How can monoculture practices degrade soil over time?

Life in the Soil

- What types of organisms live in different types of soil?
- How does soil biodiversity support healthy ecosystems?
- What is the impact of pesticides on soil organisms?

Soils and Environmental Sustainability

- How does erosion affect soil in mountainous or agricultural areas?
- What human activities contribute to desertification?
- How does urbanization impact soil quality (e.g., sealing, pollution)?

Technology and Soil Monitoring

- How can moisture, temperature, and pH sensors be used to study soil?
- What data can drones or satellites provide about soil types?
- How can computational thinking help analyze and classify soils?



CONCLUSION AND SHARING

Closure of the activity, here you may also find the “Classroom activity ” box with complementary questions, dynamics, or debate proposals that the teacher may use that are helpful for making conclusions with the participants about the activity and its content.



Encourage students to present their findings and posters. Use the hastags: **#LivingSoil**
#STEAMbrace **#SoilScience**

Don't forget to take a photo of your experience and share it with us!



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[X](#)