

Session 1: Agricultural Field Trip: Soil in a Real-World Context

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Overview

Learning Outcomes	Timeline	Material
<ul style="list-style-type: none"> Identify key soil properties (texture, color, moisture, organic matter) using field methods. Use simple observation and data collection to assess and document soil conditions. Analyze links between soil traits, plant health, and farming practices. Collaborate in mixed-ability groups to share tasks and present findings. Evaluate sustainable farming strategies and suggest improvements to soil and land use. Reflect on fieldwork by linking local observations to wider sustainability challenges. 	Preparation: 2 hours (120 minutes) Implementation: 2 hours 35 minutes (155 minutes) Travel to/from the excursion site: 1-2 hours (depending on location)	<ul style="list-style-type: none"> Safety Rules Daily Flow & Station Map Pre-Field Trip Task Sheet Soil, Plant, Tool & Sustainability Worksheets Student & Lecturer versions Sample Activity Flows (Stations 1–4)

About the session

Before the trip:

Print (or be ready to share the worksheets with students online) one full set of student worksheets per participant.

During the trip:

Distribute worksheets (or send them via mail) at the beginning of each station or in a package at the start.

After the trip:

Use the Students' Worksheets which include observation notes and reflections for assessment or debriefing.

Tips for Successful Implementation

- Coordinate with the host farm at least one week in advance.
- Prepare materials (clipboards, pencils, worksheets, safety items).
- Form groups of 4–6 students to ensure effective rotations.
- Use the station transitions to maintain timing and coherence.
- Encourage students to observe, ask questions, and apply learning across stations.



General information

Overall aim:

This session introduces students to soil and agricultural systems through direct, hands-on engagement in an authentic farm environment. The field trip is designed to strengthen students' understanding of soil health, sustainable land use, and local agricultural practices by linking scientific concepts with real-world observation and experience.

Target group:

The module is intended for students from diverse disciplines concerned with ecological, environmental, agricultural, or spatial topics. Participants may have varied levels of prior knowledge in soil science; both Bachelor's and Master's students are welcome. No prior soil expertise is required.

Time requirements:

Preparation: 2 hours (120 minutes)

Implementation: 2 hours 35 minutes (155 minutes)

Travel to/from the excursion site: 1-2 hours (depending on location)

Factual Analysis

Soil forms the foundation of agricultural production and ecological stability. From a scientific perspective, soil is a complex mixture of mineral particles (sand, silt, clay), organic matter, water, air, and living organisms. These components determine soil texture, fertility, water-holding capacity, and biological activity, all which influence plant growth and land management.

In agricultural systems, cultivation techniques aim to manage soil in ways that support crop production while maintaining soil health. Basic techniques include tillage (loosening soil), planting, irrigation, and fertilization. Each practice affects soil structure, nutrient cycling, and erosion processes. Students encounter these techniques directly during the field trip through observation of planting methods, irrigation systems, and fertilizer use.

Soil-conserving farming practices—such as mulching, composting, crop rotation, minimal tillage, and ground cover—help maintain organic matter, improve soil structure, reduce erosion, and support biodiversity. In contrast, intensive tillage, monocropping, and excessive chemical inputs can degrade soil by compaction, nutrient depletion, or loss of microbial life.

The factual content of this session therefore focuses on:

- soil properties (texture, color, moisture, organic matter)
- plant–soil interactions
- basic cultivation techniques
- principles of sustainable and soil-protective farming



This scientific foundation provides essential context for understanding the observations and hands-on activities at each station during the field trip.

Didactic- Methodological Analysis

The agricultural field trip is designed as an experiential, student-centered learning environment that integrates outdoor, inquiry-based, and cooperative approaches. Conducting the session directly in an agricultural setting enables learners to engage with authentic materials and real processes, aligning with experiential and place-based learning theories. Activities across the four stations activate multiple senses such as sight, touch, smell which increase motivation and supporting durable learning.

A key methodological principle is experiential learning, following Kolb's cycle of concrete experience, reflection, conceptualization, and experimentation. Students gain firsthand experience through soil testing, plant observation, tool handling, and sustainability exercises. These activities are paired with structured reflection tasks (e.g., Soil Story, Plant Interview, group debriefings) that help students connect observations to broader concepts in soil science and sustainable agriculture.

Cooperative learning underpins the rotation model. Students work in mixed-ability groups, share responsibilities, and learn from peers. Guided instructions from the farm facilitator and instructors promote active listening and responsive engagement. Social and collaborative skills are strengthened through joint tasks such as the "Task Relay" at Station 3 or the group sustainability plan at Station 4. These activities support communication, negotiation, and problem-solving competences essential in interdisciplinary environmental work.

The methodology also foregrounds field-based technical skills, offering students opportunities to handle real tools, participate in small-scale cultivation tasks, and observe agricultural machinery in operation. These practical experiences mirror professional workflows and reinforce procedural understanding within ecological and agricultural contexts.

Overall, the didactic design connects scientific content with real-world practice, supports interdisciplinary participation, and fosters sustainability competences from the EU GreenComp framework. By combining experiential, collaborative, and reflective methods, the field trip provides a coherent learning journey in which students develop soil-related knowledge, practical skills, and a deeper understanding of sustainable land use.



Research Literacy & Local Context

A core element of the module is building research literacy through real-world observation. By examining soils, plants, and farming practices on site, students use simple scientific methods to observe, document, and interpret environmental data, introducing them to basic empirical inquiry.

The field trip links local findings to regional and European soil challenges such as erosion, compaction, nutrient loss, and water scarcity. Using tools like the LOESS Crowd-Mapping platform, students compare their observations with wider datasets and recognize socio-ecological influences on land management.

By combining hands-on investigation with reflection, the module helps students critically read landscapes, evaluate evidence, and understand how data supports sustainable decision-making.

Learning Objectives

By the end of this field-based session, students will be able to:

1. Identify and describe key soil properties (texture, color, moisture, organic matter indicators) using appropriate field methods.
2. Apply simple observation and data-collection techniques to assess soil conditions and document field evidence systematically.
3. Analyze the relationship between soil characteristics, plant health, and agricultural practices through guided observation and inquiry.
4. Collaborate effectively in mixed-ability groups by sharing tasks, communicating findings, and co-producing short interpretive outputs.
5. Evaluate sustainable farming strategies and formulate realistic suggestions for improving soil health and land-use practices.
6. Reflect critically on the field experience by connecting local observations to broader ecological, agricultural, or sustainability challenge

References:

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.

Johnson, D. W., & Johnson, R. T. (1999). *Learning together and alone: Cooperative, competitive, and individualistic learning* (5th ed.). Allyn & Bacon.

Bianchi, G., Pisiotis, U., & Cabrera Giraldez, M. (2022). *GreenComp: The European sustainability competence framework*. Publications Office of the European Union.

<https://doi.org/10.2760/13286>



Competences and Schedule

Competence Mapping Table

Learning Objective (LO)	Related EU Green Competence	Description of Competence in This Module
LO1. Identify and describe key soil properties using field methods.	Systems Thinking	Recognizes soils as dynamic systems with physical, chemical, and biological properties that influence plant growth and landscape function.
	Exploring Complexity	Interprets multiple indicators (texture, color, moisture, organic matter) to form a holistic understanding of soil health.
LO2. Apply simple observation and data-collection techniques.	Critical Thinking	Uses structured observation sheets, tactile methods, and field tools to collect and interpret soil and plant data.
	Information Literacy	Distinguishes between types of field evidence (texture vs. color, profile vs. sample) and records findings accurately.
LO3. Analyze relationships between soil characteristics, plant health, and farming practices.	Interconnection & Interdependency	Understands how soil conditions shape plant growth, farming decisions, and sustainability outcomes.
	Systems Thinking	Connects observations across stations to view agriculture as an integrated socio-ecological system.
LO4. Collaborate effectively in mixed-ability groups.	Collaboration & Participation	Contributes to group tasks, communicates findings, and co-produces outputs such as the Soil Story or mini reports.
	Communication	Practices active listening during demonstrations and peer exchanges.
LO5. Evaluate sustainable farming strategies and propose improvements.	Action for Sustainability	Identifies soil-conserving practices and suggests context-specific improvements grounded in field observations.
	Problem Solving	Assesses real-world agricultural challenges and generates practical, feasible ideas.
LO6. Reflect critically on the field experience.	Futures Literacy	Links local soil observations to long-term issues such as climate resilience, food systems, and land stewardship.
	Self-Awareness & Reflection	Articulates personal insights and evaluates one's own learning during and after the field activities.

Schedule

The field trip is structured as a 155-minute guided learning sequence that moves from soil properties to plant observation, to farming tools, and finally to sustainable agriculture. Students rotate through four stations in small groups. Each segment supports a progressive learning flow based on experiential learning and systems-thinking principles.

Total Duration: 155 minutes (excluding 1–2 hours for travel to/from the location)

Segment	Activity	Description	Duration
Arrival & Orientation	Welcome, safety briefing, distribution of materials	Introduction by lecturer and host; overview of goals; explanation of rotation system and safety rules	15 min
Station 1	The Language of Soil: Texture & Profile Observation	Finger test, USDA triangle classification, soil color & horizon interpretation; structured recording	30 min
Station 2	Life Above the Soil: Plant and Crop Observation	Guided plant walk, growth stage identification, health indicators, “Plant Interview” role-play	30 min
Station 3	Production & Equipment: Technology and Labor	Introduction to hand tools & machinery, comparison of equipment, hands-on task relay	30 min
Station 4	Sustainability Workshop: Farming for the Future	Observation of soil-conserving practices, group sustainability mini-project, proposal development	30 min
Reflection & Closing	Q&A, synthesis discussion, reflection form	Discussion with farm manager, final insights, consolidation of learning	20 min
Travel	Arrival & Return journey	Travel to and from the farm location	1–2 hours

Session Content and Materials

Following the General Information, the next section outlines the practical implementation of the field trip. The session is structured around a series of guided learning stations that translate the theoretical foundations of soil science and sustainable agriculture into hands-on experience. Each station offers students the opportunity to apply observational techniques, engage with real agricultural practices, and work collaboratively to deepen their understanding of soil-related processes. The materials and activities described below support a clear progression from preparation to on-site learning, to reflection and consolidation.

Preparation (in advance)

Prior to the field trip, students complete the Pre-Field Trip Student Task Form, which includes short preparatory readings, guided notetaking, and question development. These tasks ensure that students arrive with a basic grounding in soil types, soil health, cultivation practices, and sustainability concepts. Completing this preparation also enables more meaningful participation in the hands-on activities and supports the inquiry-based approach of the session.

Students also receive the Practical Tips for the Agricultural Field Trip, which summarize essential safety guidance, clothing requirements, and expectations for field behavior. This information helps create a safe, organized learning environment and prepares students for active engagement throughout the excursion.

After the introductory briefing and distribution of field materials at the farm site, students rotate through four learning stations. Each station highlights a specific dimension of soil and agricultural practice, progressing from soil characteristics to plant responses, to agricultural tools, and finally to sustainable farming strategies.



Stations

Station 1: The Language of Soil

Station 1 introduces students to foundational soil properties through direct tactile and visual exploration. The activities help students learn how soils are classified, how soil properties influence plant growth, and how to interpret basic field indicators of soil health.

Purpose

To introduce students to two fundamental aspects of soil science:

- Soil texture (sand-silt-clay proportions)
- Soil profile characteristics (color, horizon features, organic matter)

Part 1: Soil Texture Determination (Finger Test + USDA Triangle)

Learning Objectives

By the end of this station, students will be able to learn:

- how to recognize soil texture classes (sand, silt, clay, loam)
- how particle size affects water retention, nutrient availability, and root development
- how to classify soil texture using tactile methods and the USDA texture triangle

Time Allocation: 30 minutes

Materials

- 3-4 soil samples (sand-rich, clay-rich, loamy, silty)
- USDA soil texture triangle
- small water spray bottles
- gloves (optional)
- clipboards + observation sheets

Activity Steps

1. Finger Test (Field Texture Analysis)

Students moisten the soil and assess:

- grittiness → indicates sand
- smoothness / slipperiness → indicates clay
- floury / silky feel → indicates silt
- balanced feel → indicates loam

Students record:



- texture feel
 - estimated proportions (low/medium/high sand–silt–clay)
2. Classification with USDA Triangle

Using the triangle template, students map their estimated proportions to identify texture class (e.g., sandy loam, clay loam, silty clay).

This step reinforces the scientific method of soil classification used worldwide.

!!! Important:

Texture is NOT determined with a color chart.

This distinction is made explicit during the demonstration.

Part 2: Soil Color and Profile Observation (If Profile Available)

Learning Objectives

By the end of this station, students will be able to learn:

- how to interpret soil color as an indicator of organic matter, drainage, and oxidation
- how soil horizons relate to land use and soil health
- how profile features differ across landscapes

Time Allocation: 30 minutes

Materials

- Munsell color chart (or simplified color sheet)
- spade or soil auger (Pürckhauer)
- exposed soil profile OR temporary test pit (provided by farm)
- clipboards + observation sheets

Activity Options

Option A: Real Soil Profile (Preferred)

If the farm has:

- ✓ an exposed cut,
- ✓ a compost trench,
- ✓ or a plough layer visible,

Facilitator shows:

- A-horizon (organic-rich topsoil)
- B-horizon (clay/iron enrichment)
- C-horizon (parent material)



Students use the color chart to note:

- browns/darks → organic matter
- reds/yellows → iron oxides / good aeration
- greys → poor drainage / waterlogging

Option B: Simplified Observation (If no profile available)

Students examine:

- topsoil color
- aggregation
- organic residues
- visible roots

This still supports meaningful interpretation without digging.

Reflection Box

Pause and Reflect (2 minutes)

- How did soil texture and soil profile characteristics differ among the samples or locations?
- Which soil would you consider most suitable for growing vegetables, and why?
- What new information did texture and color provide about soil health?

✓ Supports scientific observation, soil classification skills, and systems thinking by linking measurable soil properties to their ecological functions.

Station 2: Life Above the Soil - Plant and Crop Observation

Having examined the physical properties of soil through texture analysis and basic profile interpretation, students now move from the soil environment to the organisms it supports. Understanding plants as indicators of soil conditions helps connect the abstract properties learned in Station 1 with visible biological responses in the field.

Station 2, therefore, shifts the focus from “reading the soil” to “reading the plants,” encouraging students to observe how soil quality, moisture, nutrients, and cultivation techniques shape plant growth, health, and development. This transition deepens the systems-thinking perspective by demonstrating how soil and vegetation interact within agricultural landscapes.

Purpose



To help students understand how soil conditions influence plant growth, development, and health.

Learning Objectives

By the end of this station, students will be able to:

- identify key plant growth stages and visible health indicators.
- interpret plant responses (color, form, vigor) in relation to underlying soil conditions.
- recognize basic signs of nutrient deficiency, water stress, or pest/disease presence.
- communicate observations clearly during guided tasks and group discussion.

Time Allocation: 30 minutes

Materials

- plant identification sheets or crop fact cards
- hand lenses or magnifying glasses
- clipboards, pencils, observation sheets
- access to crop rows, garden beds, or greenhouse area
- sample leaves or plant material (optional)

Activity Steps

1. Guided Walkthrough

The facilitator leads students through a section of the crop field, orchard, or garden.

Students observe:

- leaf shape and color
- stem structure and branching
- flowering or fruiting stages
- spacing and planting density
- visible differences between plant types

The instructor explains how these features relate to the plants' ecological and agricultural needs.

2. Growth Stage Identification

Students examine selected plants and identify their phenological stage (e.g., seedling, vegetative, flowering, fruiting).

Short prompts guide students to note:

- plant vigor
- uniformity
- early or delayed development

This builds a foundational understanding of crop life cycles even for students without agronomy backgrounds.



3. Plant Health Indicators

Students look for basic diagnostic signs such as:

- chlorosis (yellowing) → nutrient deficiency
- wilting → watering or root issues
- stunted growth → compaction or nutrient limitations
- leaf spots → possible disease or pest presence

The facilitator encourages students to relate these signs to insights from Station 1 (texture, moisture, color, organic matter).

4. “Plant Interview” Role-Play (Interactive Task)

Students pair up; one plays the “plant,” the other the “interviewer.”

Questions may include:

- “What kind of soil do you prefer?”
- “What stresses are you experiencing today?”
- “What helps you grow best here?”

This light, creative activity strengthens observation, inference, and communication skills.

Reflection Box

Pause and Reflect (2 minutes)

- Which plant characteristics told you the most about soil conditions?
- What differences did you notice between healthy and stressed plants?
- How do plant observations complement what you learned about soil in Station 1?

✓ Supports experiential observation skills, ecological reasoning, and systems thinking by linking plant indicators to underlying soil and management conditions.

Station 3: Production and Equipment- Technology and Labor in Farming

Having explored how soil properties are reflected in plant health and development, students now shift their attention to the tools, technologies, and labor practices that shape agricultural production. While Stations 1 and 2 focused on natural indicators and ecological relationships, Station 3 introduces the human and technological dimensions of farming. This transition enables students to see how decisions about tools, machinery, and manual work influence soil conditions, crop performance, and overall farm sustainability.

Purpose

To familiarize students with the tools, technologies, and labor systems used in agricultural production. This station highlights how equipment choices, mechanization levels, irrigation



technologies, and manual labor practices interact with soil conditions and influence farm efficiency and sustainability.

Learning Objectives

By the end of this station, students will be able to:

- recognize basic agricultural tools and describe their functions.
- distinguish between traditional and modern equipment and discuss their respective advantages.
- assess how tool use and mechanization affect soil structure, labor demands, and environmental outcomes.
- reflect on the role of human labor within agricultural production.

Time Allocation: 30 minutes

Materials Needed:

- a selection of farm tools (e.g., hoe, rake, shovel, hand trowel)
- demonstration of mechanized equipment (tractor, plough, irrigation system), depending on availability
- Tool Function Worksheet
- safety gloves (optional)
- observation sheets & pencils

Activity Steps

1. Introduction to Tools and Technologies

The facilitator presents a range of commonly used tools and equipment. Students observe:

- the tool's purpose
- the type of work it performs
- its impact on soil (disturbance, compaction, aeration)
- ergonomic considerations for workers
- energy inputs (human labor vs. machinery)

Short demonstrations may include:

- preparing soil with a hand tool
- examining irrigation hoses, drip systems, or sprinklers
- observing mechanized equipment at rest or in operation

2. Guided Discussion: Traditional vs. Modern Equipment

Students compare:

- manual hand tools
- small-scale mechanization
- larger mechanized systems



Discussion topics include:

- labor intensity
- energy use and emissions
- cost and accessibility
- impacts on soil structure and compaction
- implications for small farms vs. large-scale operations

This helps students understand the trade-offs of different technological choices.

3. Hands-On Task Relay (Optional Interactive Component)

In small groups, students complete a brief “Task Relay,” rotating through simple challenges such as:

- moving soil using two different tools
- setting up a short length of irrigation tubing
- assembling a simple hand tool (if appropriate)
- observing differences in ease, time, and soil disturbance

This activity strengthens collaboration and allows students to personally experience tool functions.

4. Human Labor and Sustainability Conversation

The facilitator leads a short reflection on farm labor:

- How much physical effort is required for different tools?
- What labor challenges do farmers face?
- How can technology support—but also complicate—sustainability goals?

Students relate these insights to real agricultural contexts.

Reflection Box

Pause & Reflect (2 minutes)

- Which tool or technology seemed most essential for farm operations, and why?
- How did manual labor compare with mechanized work in terms of effort, efficiency, and soil impact?
- What did this station reveal about the relationship between labor, technology, and sustainability?

✓ Supports practical awareness, systems thinking, and sustainability reasoning by helping students connect tool use, soil disturbance, and labor demands.



Station 4: Sustainability Workshop — Farming for the Future

After examining how tools, technologies, and labor practices shape agricultural production, students are now ready to integrate their observations into broader sustainability considerations. While Station 3 highlighted the human and technological dimensions of farming, Station 4 focuses on long-term environmental stewardship and soil-conserving strategies.

Station 4 therefore moves from how farming is done to how farming can be improved by exploring practical examples of sustainable land management. This final station invites students to synthesize insights from the entire field trip and develop concrete ideas for responsible and resilient agriculture.

Purpose

To introduce students to soil-conserving agricultural practices and to encourage them to evaluate current farm operations through a sustainability lens. This station helps learners connect scientific understanding with actionable strategies for improving soil health, resource efficiency, and long-term farm resilience.

Learning Objectives

By the end of this station, students will be able to:

- identify examples of sustainable soil and water management practices.
- explain how specific techniques (e.g., composting, mulching, cover crops) contribute to soil health.
- evaluate the sustainability of observed farm practices and identify areas for improvement.
- propose realistic recommendations for enhancing ecological and agricultural resilience.

Time Allocation: 30 minutes

Materials Needed

- examples of sustainable practices available on-site (compost, mulch, drip irrigation, cover crop patch, organic residues)
- short sustainability prompt cards
- clipboards, pencils, observation sheets
- group planning template (“Mini Sustainability Plan”)



Activity Steps

1. Introduction to Sustainable Practices

The facilitator presents real examples of practices observed on the farm, such as:

- composting for nutrient cycling
- mulching for moisture retention and erosion control
- cover cropping or intercropping for biodiversity and soil protection
- efficient irrigation systems (drip lines, scheduling)
- reduced tillage approaches

Students discuss why each practice contributes to soil conservation and long-term sustainability.

2. Field-Based Observation and Evidence Gathering

In small groups, students walk through designated areas to observe existing sustainability features. They note:

- how the practice is implemented
- visible effects on soil or plants
- strengths and limitations
- connections to soil properties studied in Station 1
- visible plant responses discussed in Station 2
- technological or labor implications from Station 3

This reinforces systems thinking and interdisciplinary connections.

3. Mini-Project: Designing a Farm Sustainability Improvement Plan

Groups use a short template to propose one realistic sustainability improvement for the farm.

Examples include:

- introducing a cover crop rotation
- improving irrigation efficiency
- adding organic matter through compost use
- reducing compaction in a specific area
- adopting low-till or no-till zones
- enhancing biodiversity through hedgerows or buffer strips

Students justify their proposal using the observations collected throughout the field trip.

4. Group Sharing and Facilitator Feedback

Groups briefly present their ideas, highlighting:

- the problem they identified



- the sustainable practice they propose
- how their solution benefits soil, plants, and overall farm resilience

The facilitator responds with practical insights and real-world considerations.

Reflection Box

Pause & Reflect (2 minutes)

- Which sustainable practice stood out as most effective or innovative, and why?
- What change would have the greatest long-term impact on soil health at this farm?
- How do the sustainability challenges you observed connect to global issues like food security or climate resilience?

✓ Supports action for sustainability, problem-solving, and futures literacy by translating observations into practical, forward-looking recommendations.

Final Wrap-Up and Reflection

The final part of the field trip brings together insights gained across the four learning stations and encourages students to consolidate their understanding through structured reflection. This closing session allows learners to revisit key observations, articulate connections between soil, plants, technology, and sustainability, and evaluate how their field experience relates to broader ecological and societal challenges.

Purpose

To synthesize field-based learning, reinforce systems-thinking perspectives, and support students in integrating practical observations with theoretical understanding.

Time Allocation: 20 minutes

Activity Components

1. Whole-Group Debrief (10 minutes)

The facilitator leads a guided discussion drawing on prompts such as:

- What were your most surprising or meaningful observations today?
- How did the different stations complement each other?
- Which connections between soil, plants, tools, and sustainability became clearer during the field work?

Students are encouraged to share both scientific insights and personal impressions. This exchange strengthens collaborative learning and helps identify common themes across the field trip.



2. Q&A with the Farm Manager or Agricultural Engineer (5 minutes)

Students ask open questions about:

- farm management challenges
- soil and water constraints
- labor and technology decisions
- sustainability priorities
- long-term environmental pressures

This interaction links student observations to real-world agricultural decision-making and provides authentic insight into farm operations.

3. Individual Reflection and Learning Consolidation (5 minutes)

Students complete the Reflection Sheet (see Print Templates) and write short responses to prompts such as:

- What is one key insight you gained about soil health or sustainable farming?
- How has your understanding of agricultural systems changed because of this field trip?
- Which aspects of today's learning relate to your academic discipline or future profession?

These reflections support metacognitive development and reinforce the transfer of learning beyond the excursion.



Templates

Pre-Field Trip Student Task Form

Purpose:

To help you prepare for the agricultural field trip by reviewing basic concepts and formulating questions to guide your learning.

Instructions:

Please complete the tasks below before the field trip and bring this sheet with you.

1. Short Preparatory Reading

Read the assigned materials on:

- soil types and basic soil properties
- soil health and ecosystem functions
- sustainable agriculture concepts

Write down three key points you learned:

1. _____
_____.
2. _____
_____.
3. _____
_____.

2. Guided Notetaking

Note two things you already know (or think you know) about soils or farming:

- _____
_____.
- _____
_____.

3. Your Questions

Write two questions you would like to explore during the field trip:



- _____?
_____?
- _____?
_____?

4. Expectations

What do you expect to observe or experience on the farm?

- _____.
_____.
- _____.
_____.



Practical Tips for the Agricultural Field Trip

Please read the following information carefully to ensure a safe and enjoyable experience.

- Wear comfortable, weather-appropriate clothing.
- Bring sturdy shoes suitable for walking on uneven ground.
- Bring drinking water, sun protection, and a light snack.
- Follow all instructions provided by the lecturer and farm host.
- Always stay with your group.
- Do not touch equipment or animals unless instructed to do so.
- Be respectful of crops, tools, and farm property.
- Report any safety concerns immediately.



Safety Rules for the Agricultural Field Trip

1. Behavior on the Farm

- Always stay with your group and follow your teacher or guide.
- Do not run — farm terrain can be uneven and slippery.
- Keep a safe distance from all farm machinery and never touch equipment unless instructed.
- Listen carefully to instructions before starting any activity.

2. Hygiene & Health

- Wash your hands or use sanitizer after touching soil, plants, or animals.
- Do not eat or drink anything from the farm unless it is approved by the guide.
- Inform a teacher immediately if you feel unwell, dizzy, or get injured.

3. Animal Safety (if applicable)

- Approach animals calmly and only if permitted by the guide.
- Never feed animals without permission.
- Keep hands away from animal mouths, hooves, or sharp objects in enclosures.

4. Environmental Respect

- Do not pick plants or damage crops without instruction.
- Avoid stepping on planted rows or seedlings.
- Take all your litter with you — leave the farm as you found it.

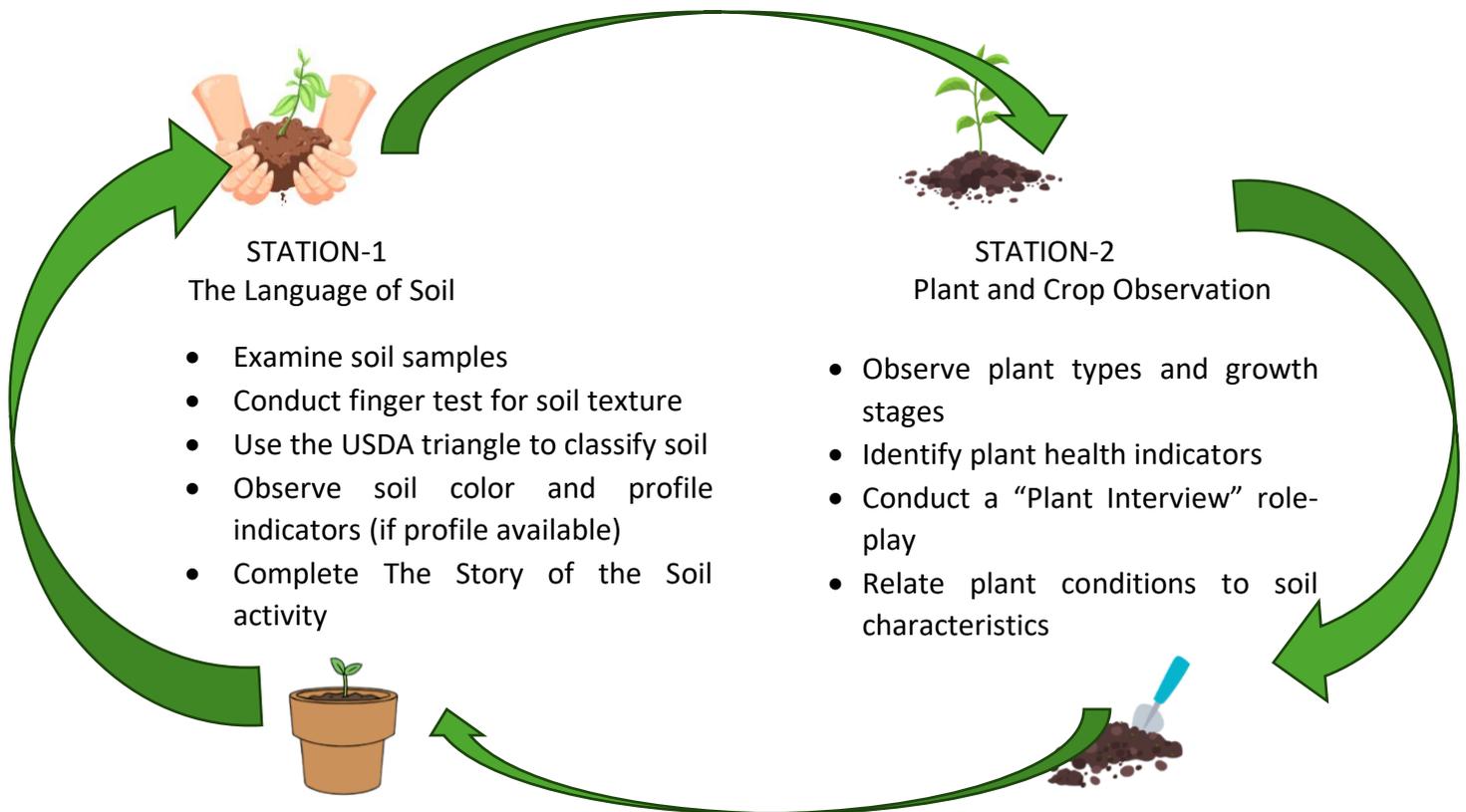


Daily Flows and Station Map

Welcome and Introduction-15 minutes

- Meet the farm host and cooperation partner
- Overview of the day's schedule and rotation system
- Circle of Expectations: each student shares one thing they hope to learn

Station Rotation-120 minutes



STATION-1
The Language of Soil

- Examine soil samples
- Conduct finger test for soil texture
- Use the USDA triangle to classify soil
- Observe soil color and profile indicators (if profile available)
- Complete The Story of the Soil activity

STATION-2
Plant and Crop Observation

- Observe plant types and growth stages
- Identify plant health indicators
- Conduct a "Plant Interview" role-play
- Relate plant conditions to soil characteristics

- STATION-4**
Farming for Future
- Observe sustainable farming practices (mulching, composting, etc.)
 - Develop a group sustainability improvement plan

- STATION-3**
Production and Equipment
- Explore farming tools and machinery
 - Compare manual vs. mechanized equipment
 - Participate in a short Task Relay (optional hands-on tool use)



Soil Observation Form (Station 1)

Location: _____

Group Members: _____

1. Soil Texture (Finger Test)

Describe the feel of the soil sample:

- Gritty (sand)
- Smooth/slippery (clay)
- Silky/floury (silt)
- Balanced (loam)

Notes: _____

_____.**2. Texture Classification (USDA Triangle)**

Estimated proportions:

Sand: ____% Silt: ____% Clay: ____%

Texture class: _____

Detailed Data Sheet – Perfect for students in environmental science, agriculture, geography, ecology:

3. Soil Color / Profile Indicators

Color (using chart): _____

Visible horizon features (if profile available):

- Organic matter: Low Medium High
- Moisture: Dry Moist Wet
- Structure/aggregation: _____

Additional Notes

_____

Student Recording Sheet (Station 1)

(Simplified Notes Sheet*)

Station 1 — The Language of Soil

- Soil Type Observed: _____
- Texture: _____
- Colour: _____
- Moisture Level: _____
- Notes on Soil Structure/Smell (if applicable): _____
- One key insight I gained: _____

*: Suitable for all disciplines, even students without science background



Plant Observation Sheet (Station 2)

Location: _____

Plant Type (if known): _____

1. Growth Stage

- Seedling
- Vegetative
- Flowering
- Fruiting

Notes: _____
_____**2. Plant Health Indicators**

Check any that apply:

- Green and vigorous
- Yellowing (possible nutrient deficiency)
- Wilting (possible water/root issue)
- Spots/lesions (possible disease)
- Stunted growth

Detailed Data Sheet – Perfect for students in environmental science, agriculture, geography, ecology:

Notes:

_____**3. Soil–Plant Connection**What does the plant suggest about underlying soil conditions?

_____

Student Recording Sheet (Station 2)

(Simplified Notes Sheet*)

Station 2 — Plant and Crop Observation

- Plant / Crop Name: _____
- Growth Stage: _____
- Leaf Shape & Colour: _____
- Stem / Root Notes: _____
- One interesting observation: _____

*: suitable for all disciplines, even students without science background



Tool Function and Safety Worksheet (Station 3)

During the tool exploration phase, fill in the chart below based on your observations. Use short notes, this sheet is for quick fieldwork recording.

Tool/Machine Name	Main Function	How It is Used in Farming
Hoe		
Rake		
Watering Can		
Hand Trowel		
Tractor/seedler		

Safety Precautions:

Reflection:

What is one thing you learned about tools or technology today?



Tool Function and Safety Worksheet (Station 3)

(Lecturer Reference — Completed Example)

Tool/Machine Name	Main Function	How It's Used in Farming
Hoe	Soil loosening, weeding	Breaking crust, preparing rows
Rake	Smoothing soil surface	Leveling beds, removing debris
Watering Can / Hose	Irrigation	Watering seedlings, supporting germination
Hand Trowel	Small-scale digging	Transplanting seedlings, removing weeds
Tractor / Seeder	Mechanized soil prep or sowing	Large-scale cultivation, seeding rows

Safety Precautions

- Always keep distance from machinery.
- Carry tools with blades facing downward.
- Use controlled movements, especially in groups.
- Only operate mechanized tools under instructor guidance.



Sustainability Mini-Project Sheet (Station 4)

Group Members: _____

Practice Observed: _____

Why it is sustainable:

Possible improvements: _____

One-sentence takeaway: _____



Sample Activity Flow for Station 1 (Lecturer Use Only)**‘Plant and Crop Observation’**

(Students use the Soil Observation Form, see Appendix 5 OR Student Recording Sheet, see Appendix 6 during this activity, Station 1 Printable.)

1. Introduction (5 minutes)

Facilitator explains:

- why soil texture, moisture, and color matter in agriculture.
- how soil properties influence root growth, water retention, and crop suitability.
- a short demonstration: taking a soil sample, moistening it, forming a ribbon, and describing the tactile feel.

Facilitator emphasizes:

“Soil is like a book — its texture, color, and structure tell a story about its history and potential.”

2. Hands-On Activity (15 minutes)**Step 1 — Texture Test (Finger Test)**

Students rub a moistened soil sample between their fingers to identify:

- gritty → sand
- smooth/slippery → clay
- silky/floury → silt
- balanced → loam

Students record their observations using the Soil Observation Form, see Appendix 5 OR Student Recording Sheet, see Appendix 6.

Step 2 — Moisture Assessment

Using the “squeeze test”:

- crumbles → dry
- holds shape / breaks apart → ideal moisture
- sticks or clumps → high moisture

Students record moisture level (low/medium/high).



Step 3 — Color Classification

Students hold soil against the color chart to identify:

- organic matter indicators
- drainage conditions
- signs of oxidation or reduction

(Note: this aligns with your corrected profile interpretation.)

3. Interactive Task — “The Story of the Soil” (7 minutes)

Groups create a 1-minute soil story using the prompt:

“I am a soil that _____. I live in _____. I grow _____ best.
My biggest challenge is _____.”

One student present; others ask a short follow-up question.

4. Wrap-Up & Reflection (3 minutes)

Facilitator summarizes:

- how texture and color influence suitable crops and farming methods.
- why farmers test soils before planting.
- which soil is ideal for water retention vs. drainage.

Reflection question:

“Which soil would you choose for growing tomatoes — and why?”

EU GreenComp competencies including:

- Systems Thinking: connecting soil properties to plant performance
- Sustainable Resource Management: matching soil capacity with land use



Sample Activity Flow for Station 2 (Lecturer Use Only)**‘Plant and Crop Observation’**

(Students use the Plant Observation Sheet, see Appendix 7 OR Student Recording Sheet, see Appendix 8 during this activity, Station 2 Printable.)

1. Introduction (5 minutes)

Facilitator briefing:

“In this station, we will explore how plants grow above the soil and what they can tell us about their environment, their needs, and the conditions of the soil beneath them.”

Quick recall from Station 1:

“How does soil affect what we see above ground? Which soil properties might influence plant health?”

This connects tactile soil observations from Station 1 to visible plant indicators in Station 2.

2. Guided Observation (10 minutes)

Students rotate among 2–3 plant examples (e.g., wheat, beans, corn, vegetables, or seasonal crops).

Tasks:

- Identify visible plant structures: leaves, stems, flowers/fruits, branching patterns, and root exposure if visible.
- Compare two plants:
Which appears healthier? Why?
Students consider:
 - > soil moisture
 - > nutrient availability
 - > pest or disease signs
 - > compaction or shading
- Facilitator briefly explains how farmers “read” plant signals to guide watering, fertilizing, or protective measures.

3. Interactive Activity — “Plant Interview” Role Play (10 minutes)

Students pair up:

- One acts as the plant
- The other acts as the interviewer



Suggested prompts:

- “What do you need most to grow well?”
- “How do you feel when the soil gets too dry or too wet?”
- “What challenges are you facing in this field?”
- “How do you know when you are getting enough sunlight?”

After 5 minutes, students switch roles.

Groups then share 1–2 funny, surprising, or insightful “quotes” from their plant.

This reinforces empathy, creativity, and interpretation of plant signals.

4. Reflection and Recording (5 minutes)

Students record their observations using the Plant Observation Form, see Appendix 7 OR Student Recording Sheet, see Appendix 8.

OR Students complete three small tasks in their notebooks:

1. Sketch one plant they observed (focus on leaf or stem structure).
2. Write 2–3 sentences:
“The most important thing I learned about plant life today is...”
3. Quick share-out: 2–3 volunteers present their reflection.

This closes the loop of observation → interpretation → communication.

EU GreenComp competencies including:

- Systems thinking (soil–plant interactions)
- Critical thinking (interpreting health indicators)
- Collaboration & participation (pair work and group discussion)
- Responsibility for sustainability (recognizing plant needs for healthy growth)



Sample Activity Flow for Station 3 (Lecturer Use Only)

Production and Equipment

(Students use the Tool Function & Safety Chart during this activity, see Appendix 9, Station 3 Printable.)

1. Introduction & Safety Briefing (5 minutes)

Facilitator introduction:

“Farming relies on a combination of human labor and technology. In this station, we will explore the tools and machinery that support agricultural production and discuss how they shape both efficiency and sustainability.”

Safety reminders:

- Handle all hand tools carefully.
- Always maintain a safe distance from machinery.
- Do not operate mechanized tools unless explicitly permitted.
- Always walk — no running near equipment or uneven ground.

Materials distributed:

- Tool Function & Safety Chart (see Appendix 9, Station 3 Printable)

2. Tool Exploration & Identification (8 minutes)

Facilitator demonstrates 3–4 common tools (e.g., hoe, rake, trowel, watering can), names them, and explains their function

Students rotate between tool tables, touch/observe tools, and record using the Tool Function & Safety Chart:

- Tool name
- Main function
- How it is used in farming
- Safety precautions

3. Hands-On Group Task (12 minutes)

Students work in small groups (4–5 students) on a short, practical assignment. Each group completes one mini-project, such as:

- Planting seedlings in straight rows using a planting stick or trowel
- Watering and lightly cultivating a small patch of soil



- Setting up a basic irrigation demonstration (hose or watering can)
- Light weeding or debris removal using hand tools

Group workflow:

- Students divide roles (tool handler, recorder, observer, timekeeper).
- Groups complete the task collaboratively.
- Roles rotate so each student handles at least one tool.

Facilitator role:

Circulate between groups, observe tool use, provide feedback on technique, posture, coordination, and teamwork.

4. Reflection & Discussion (5 minutes)

Group discussion questions:

- “Which tool was the most effective for its task? Why?”
- “How does machinery change the type and amount of labor farmers must perform?”
- “What challenges do farmers face when balancing manual work and mechanized work?”

Individual notetaking:

Students write one takeaway sentence on their Tool & Technology Worksheet, such as: “I learned that sustainable farming requires both practical skills and appropriate technologies.”

Key Competences Strengthened

- EU GreenComp: Systems Thinking, Collaboration, Action for Sustainability.
- Vocational: Sector-specific tool handling skills.
- Personal: Communication, teamwork, reflective learning.



Sample Activity Flow for Station 4 (Lecturer Use Only)

'Farming for the Future'

(Students use the Sustainability Mini-Project Sheet during this activity, see Appendix 11, Station 4 Printable.)

1. Introduction (5 minutes)

Facilitator opening question:

“What does sustainability mean to you in the context of farming?”

Students share one word each (e.g., balance, recycling, future, soil, biodiversity) and the facilitator notes them on a flipchart or clipboard.

Brief input:

The facilitator links sustainable farming practices to broader goals, such as:

- EU Green Deal priorities
- soil health
- biodiversity protection
- climate-neutral and resource-efficient agriculture

2. Exploration Activity — Rotating Mini-Stations (10 minutes)

Students rotate in small groups among three sustainability mini stations:

Mini-Station 1 — Composting & Soil Health

Students compare:

- Organic compost (texture, smell, moisture, decomposition)
- Chemical fertilizer (granules, concentration)

Discussion prompt:

“How does compost support long-term soil fertility?”

Mini-Station 2 — Water Conservation

Students observe:

- Drip irrigation (efficient water delivery)
- Flood irrigation (waste and evaporation)
(if no real setup is available, use photos or models)



Prompt:

“How does this system conserve water and protect soil?”

Mini-Station 3 — Energy & Technology

Students explore visuals or models of:

- solar-powered irrigation
- biogas systems
- low-energy pumps

Prompt:

“How does this technology reduce environmental impact?”

At each mini-station, groups answer:

“How does this practice support sustainability?”

This reinforces analysis, systems thinking, and real-world relevance.

3. Interactive Task — Design a Mini Sustainable Farm Plan (10 minutes)

Groups receive a short scenario, such as:

“You are managing a small farm with limited water supply and want to improve soil health.”

Using flipchart paper or marker boards, groups:

- Select 2–3 sustainable practices (e.g., mulching, composting, drip irrigation, crop rotation).
- Explain why these practices would improve environmental, economic, or social resilience.

Quick presentations:

Each group presents for 1–2 minutes, followed by 1–2 short questions from peers.

This promotes problem-solving, communication, and application of knowledge.

4. Reflection & Wrap-Up (5 minutes)

Guided whole-group reflection:

- “Which sustainable practice impressed you the most, and why?”
- “How do farming choices affect climate resilience and food security?”



Individual takeaway sentence:

Students write in their notebooks or on their worksheet:

“Sustainable farming means...”

or

“One practice I will remember from today is...”

This consolidates learning and prepares students for the final field trip wrap-up.

Aligned with EU GreenComp, this station strengthens:

- Critical Thinking (evaluating practices)
- Problem-Solving (designing a farm plan)
- Environmental Awareness (impact of farming choices)
- Collaboration & Communication (group task + presentations)

