

Description

This is a very practical and dynamic activity. Participants will be asked to touch, feel, observe and interact with the soil. Participants from every background can learn through direct experience which combines movement (practical activity) and relaxation (observation) and develop a deeper connection with such an important element: the soil.

Soil is the foundation of every kind of ecosystem living on earth. There is a strong correlation between the health of the soil and the health of communities. Plants need good soil to prosper. When planting and growing food, soil becomes a fundamental aspect to take into consideration. Soil testing is a key tool in sustainable soil management and, consequently, in permaculture as well. Soil testing also allows us to monitor in time what's the impact of our activities on the ecosystem and to understand how (and if) we are regenerating the soil.

Soil texture / soil components

The way a soil "feels" is called soil texture and represents the percentage or relative proportion of sand, silt and clay present in a soil. Sand, silt, and clay are names that describe the size of individual particles in the soil, as a result of primordial stones decomposition. Soil texture is fundamental to soil properties and their impact on plant growth and overall farm productivity. Texture is a parameter that influences soil behavior in many ways, being an important factor in water retention and availability, soil structure, aeration, drainage, soil workability and trafficability, soil biodiversity, and the supply and retention of nutrients. It is for this reason that measuring soil texture is of great importance in agricultural production.

Teaser

Have you ever realized how important the soil is?

Soil is the foundation of every kind of ecosystem living on earth. When planting and growing food, soil becomes a fundamental aspect to take into consideration. Soil testing is a key tool in sustainable soil management and allows us to monitor in time what the impact of our activities in terms of soil regeneration is.

Do you want to learn more about soil testing? Come and join us. We will practice the so-called Jar Test, which will give us a picture of the soil texture. In the triangle you can see how the texture of the soil varies with the composition of clay, sand and silt. Together we will then get our hands dirty and see how these elements compose the soil. We will discuss how texture impacts plant growth and other functions of the soil.

It would be great if you'd manage to bring some soil from different locations. That way we could compare different soils and see if there are differences in the texture.











Photos/Images



Competences addressed

Ecological competences:

- Knowledge about geographical structures and landscapes
- Knowledge about water-management
- Knowledge and skills about soil composition and compost
- Knowledge about permaculture

Social and individual competences:

- Connection with the environment
- Precision and structure
- Attention focus and sense of observation
- Time management / slow-activity vs. fast-activities / thinking in terms of time-taking processes
- Self organization within groups / mutual training / learning by doing
- Self confidence in experimental activities











Learning objectives

The objective of this activity is to learn about soil composition and soil formation processes. Participants learn how to recognize different types of soil and have the opportunity to share knowledge about which plants fit better to a specific type of soil.

This exercise combines fun and science. While getting their hands dirty, participants can play with different jars and have fun shaking the soil. This would allow them to have a better learning experience and the learning outcome will stay with them longer, as associated with a moment of fun.

The full experience wants to show participants how the soil formation results from millennial decomposition processes and how forces of nature have played together for ages, resulting in what we now call soil and gives us foods and plants.

Group characteristics

This is a learning experience for participants from any background.

Ideally, couples could be: someone who has already done the activity before at least once (soil ambassador) + someone who has never (new comer). In this case, a further dimension of mutual learning and training would occur.

Preparation for the activity

Essential toolkit: Jar(s) and lid(s) in equal numbers, water, soil, permanent marker(s). Beautifully arrange the toolkit on a table that looks inviting for participants. Colorful paper for brainstorming or displaying information, bowls and spoons to better handle the soil can be of support. Speaker, or music in general, is a plus.

The toolkit for this activity is characterized by its simplicity and affordability. It is good for facilitators to practice this activity in advance to get a feeling of how much water is needed and the proportion of soil and water to use in order to get the best result.

The activity / the content

Introduction

1. Introduction: what does "soil texture" mean? What are the different components of the soil (sand, silt, clay and organic matter)?

2. Ask participants if they know what these terms mean and eventually let them guess what could be the difference among them (the difference is: clay particles are smaller than 0.002 mm in diameter. Some clay particles are so small that ordinary microscopes do not











show them. Silt particles are from **0.002 to 0.05 mm in diameter**. Sand ranges from 0.05 to 2.0 mm.)

3. Explain to participants what the components are, what's the difference among them (by means of examples; ideally you could bring sand and clay and let participants touch them to feel the difference).

Hands-on activity

4. Divide participants into 2-ppl groups.

5. Ask every couple of participants to go around and take half a jar of soil from a place they find interesting - the texture of that specific soil will then be analyzed (alternatively you can ask participants before the activity to bring some soil, e.g. from their garden or from a place that they like, or a soil they are curious about).

6. Have a round with some consideration of the different soils - **introduction of the soil**. Ask participants to touch and feel the soil and make assumptions about the percentage of each component (very approximately). Ideally, you should bring some sand and clay to let them experience the difference among the two.

7. Ask participants to Break up all lumps if necessary and to remove any large stones (>2mm) or large organic matter (sticks, roots, etc.). This activity could take some minutes and give time to talk. Here there are two option:

a. Either you leave participants free to talk about what they want and this way they'll get to know each other and improve social skills

b. Or you pick a topic / ask a thematic question.

8. Using your fingers, pack the soil down as much as possible to reduce pore space and mark the level of soil on the side of the jar with a pen.

9. Stir in water until ³/₄ full, then shake well for 3 minutes or until the sample is fully suspended in the water. Here some music can be played or physical activities in general.

10. Leave for 10 seconds then mark on the side of the jar the top level of settled material: this is the volume of sand, as it is the heaviest one and the first one which settles down.

11. Leave for another 10 minutes and mark the top level of newly settled material: this is the volume of silt.

12. What is floating on top of the water is organic matter. Clay is still suspended in the water and will take up to 24 hours to settle down. Participants can take the jar back home with them and see the final result the day after.

13. In case you went for 6.b. (asking a question) you can re-discuss now the assumptions that participants did at the beginning, about the type of soil and the composition.

<u>Closing</u>

Collect and mix a bit of all the soils and plant a seed. The common ground would be a symbol of unity, diversity & integration.











Follow up

With the same soil you can carry out other experiments (e.g. pH value - how can we modify acidity with permaculture?), to get a better picture of the soil and a wider set of indicators.

With participants from a more scientific background, you can use the soil textural triangle, assess the percentage of the different components and identify the type of soil.

Questions for reflection, self-assessment and conclusions

- Why is soil so important for both nature and society?
- Why is soil testing so important for gardening?
- How does soil texture affect the several functions of the soil?
- How do different crops adapt to different soil texture? What crops are better suited for different soil texture?
- How could we change the soil texture?
- Observing the deposition process and exploring the soil formation process, did you find any particular dynamics that could be reflected on our societies (e.g. reflection on different roles of individuals in the societies or different communities having different voice/weight in global political debates)?
- Why is it so important to preserve the soil?

Recommendations on how to adapt to different target groups

- Clearly instruct participants about the proportion of soil and water (explain to them that it's not so strict, but there should be a good proportion of water and soil in order to get a clear result with a bit of practice, it gets easier).
- Check the words (mostly sand, clay and silt) in the language of your participants.
- Prepare a visual explanation of the procedure.
- If people are afraid to walk around to collect the soil, you should organize a "mentor" for these groups, which can accompany the exploration.
- Observing: if there are some e.g. blind participants, put them in a couple with one person who can; invite them to self organize in order to tackle this challenge.
- Advise people to pay attention and don't expose themselves to risk while they are collecting the soil or practicing the experiment.
- If participants come from a more scientific background, pay more attention in using jars of the same size.











References

Food and agricultural organization of the United Nations - Soil testing methods - Global Soil Doctors Programme. A farmer-to-farmer training programme

Soil testing protocol developed within the Open Soil Atlas project (Berlin) <u>https://www.notion.so/9-Soil-Texture-The-Jar-Test-de04f537997a47ed81efa4bbf8c6983c</u>







