Earthworm observation protocol (vibration method)

The protocol is based on observational indicators used in forest ecology and biodiversity monitoring, adapted for citizen science to allow reliable recording without specialised equipment.

20' (average time to complete activity)

Introduction

Earthworms are among the most important organisms in forest soils. By digging, feeding, and moving through the ground, they mix organic matter with mineral soil, improve soil structure, and help water and air circulate. Their activity supports plant growth and plays a key role in the cycling of nutrients and carbon.
Because earthworms live mostly underground, their presence is not always easy to observe. This activity introduces a simple method that encourages earthworms to come to the surface using gentle vibrations. Similar techniques are sometimes used in ecological field studies to estimate earthworm activity without digging the soil.
The aim of this protocol is not to count all individuals precisely, but to observe whether earthworms are present and how active the soil appears to be.

When & Where to do it

This activity works best when the soil is **moist** and not frozen.
Good conditions:
After rain
In spring or autumn
In shaded forest areas

Hint: Very dry or very cold soil may give no results.

What you need

Mobile phone with the app
A wooden stick or thick sturdy branch
A small flat piece of wood (optional)
Notebook (optional)

If you like to delve dipper in an *earthworm charming activity*, look for additional material in our **Learning Resources**.
There is even The World Worm Charming Championships that take place every year in a small England village.
Link below:
https://www.youtube.com/results?search_query=worm+charming+world+championships

Step-by-step observation

1. Choose a place
Select a small area of soil, about one square meter, where the ground is not too compacted.
Avoid damaging roots, plants, or sensitive habitats.

2. Create gentle vibrations
Push a wooden stick firmly into the soil.
Move the stick back and forth or tap the ground repeatedly to create vibrations.
You can also place a piece of wood on the ground and tap on it with another stick.
Continue for about 5-10 minutes.
Alternatively you could try jump or dance on the ground!

3. Watch the soil surface
Look carefully at the ground around the stick.
Earthworms may begin to come to the surface after a short time.
Sometimes only one or two appear, sometimes more. Gently collect the worms.
Do not harm the worms and after observation, allow them to return to the soil.

4. Observe the soil condition
Notice also:
soil moisture
presence of litter
roots
small holes or tunnels
other soil animals
These are all signs of soil activity.

Indicators to record

Earthworms observed (none / few / several / many)

Number of earthworms and type
(To help you identify the ecological types check the Learning resources on the website, or the link below:
https://ahdb.org.uk/knowledge-library/soil-macrofauna-earthworms)

Soil moisture (dry / moist / wet)

Litter present (yes / no)

General impression of soil activity

Photos can be added if possible.

Data entry in the App

The mobile application guides the activity step by step and allows the observation to be recorded as part of the flows module.

Methodological background

Earthworms are often used as indicators of soil quality because their activity reflects moisture, organic matter, and soil structure. Methods using vibration or mild stimulation are sometimes used in field ecology to bring worms to the surface without digging. This protocol uses the earthworm charming technique as a non intrusive way to observe and assess the presence, number and species of earthworms in a forest. Although this simplified activity does not provide precise measurements, repeated observations can help compare soil conditions between different forest sites.
Earthworm activity is closely linked to decomposition and nutrient cycling, and therefore to the overall resilience of the forest ecosystem.

Based on the sources:

Burton, Victoria & Cameron, Erin. (2021). Learning More About Earthworms With Citizen Science. Frontiers for Young Minds.

De Wandeler, H., Bruelheide, H., Dawud, S.M., Dănilă, G., Domisch, T., Finér, L., Hermy, M., Jaroszewicz, B., Joly, F.-X., Müller, S., Ratcliffe, S., Raulund-Rasmussen, K., Rota, E., Van Meerbeek, K., Vesterdal, L., Muys, B. (2018).
Tree identity rather than tree diversity drives earthworm communities in European forests. Pedobiologia, 67, 16–25.
https://doi.org/10.1016/j.pedobi.2018.01.003