

# Soil ecosystems

<b>Focus questions</b>	Is soil alive? What are the characteristics of living things?
<b>Learning target</b>	Students observe soil ecosystems to determine how changing environmental conditions impact soil biodiversity.

## HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

<b>Performance expectation</b> HS-LS2-6	<b>Classroom connection:</b> Students evaluate the claim that soil is alive through observation of freshly dug and dry soils. Students identify and describe evidence to support or refute the claim that soil is alive.
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## Science and engineering practices

<b>Engaging in Argument from Evidence</b>	<b>Classroom connection:</b> Students describe the strengths and weaknesses of the claim “soil is alive” by comparing the characteristics of living things to soil.
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## Disciplinary core ideas

<b>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</b>	<b>Classroom connection:</b> Students observe different soil samples to identify living and nonliving characteristics in the soil samples.
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## Cross-cutting concepts

<b>Stability and Change</b>	<b>Classroom connection:</b> Students determine the changes and similarities in soil ecosystems.
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## Materials

- Soil that has been dried
- Soil that has been freshly collected from a planted area
- Soil that has been collected from a non-planted area

## Teacher preparation

1. Collect soil samples as described above. The dried soil may be left out to air dry or dried in a drying oven. About 1L of soil of each type should be enough for the class.
2. Provide the claim “*soil is alive*” to students as you pass some freshly-dug soil and dehydrated (completely dry) soil samples around for the students to observe. If you do not have access to fresh and dehydrated soils, show them some images such as these:



[commons.wikimedia.org/wiki/  
File:Worms\\_in\\_soil\\_factory.jpg](https://commons.wikimedia.org/wiki/File:Worms_in_soil_factory.jpg)



[pixabay.com/photos/earth-dry-  
dehydrated-cracked-928260/](https://pixabay.com/photos/earth-dry-dehydrated-cracked-928260/)

3. Ask students to brainstorm evidence to support or refute the claim statement individually for one minute, then share their evidence within small groups (three or four students) for two to three minutes.
4. Have groups share their evidence one by one with the large group until all are shared and recorded. Create an evidence board to keep track of the data provided by students as you lead the discussion.
5. Brainstorm the characteristics of living things with the students and add them to the board.
6. Ask students to organize the individual pieces of evidence on the board into reasoning statements that support or refute the claim “*soil is alive*.”
7. To begin investigating this claim, have students brainstorm ways they might test their claims by planning and conducting investigations.

See these resources for additional information:

- [blog.rsb.org.uk/the-living-soil-tread-carefully/](http://blog.rsb.org.uk/the-living-soil-tread-carefully/)
- [fao.org/fao-stories/article/en/c/1263004/](http://fao.org/fao-stories/article/en/c/1263004/)
- [soils4teachers.org/biology-life-soil](http://soils4teachers.org/biology-life-soil)

Use the lessons in the *Soil & Sustainability* high school unit to address the claim “*soil is alive*.”