Soil Your Undies for Healthy Soil

Middle School, Earth Science

Task Overview

In this task, students will explore how soil health is maintained by understanding the complex interactions between living and nonliving factors in a soil ecosystem. By using models and experiments, such as the "Soil Your Undies" challenge and the slake test, students will analyze how soil organisms interact with components like air, water, and minerals to affect soil stability and nutrient cycling. As they engage in critical thinking about these relationships, students will recognize that promoting soil health is not just about a single action—it requires a combination of strategies. This understanding will help them connect their learning to real-world applications, as protecting and improving soil health is essential to ensuring long-term environmental stability and human well-being.

Next Generation Science Standards

Three-Dimensional Claim

Use a model to describe how the interactions of soil organisms with other living things and nonliving factors affect the health and stability of a soil ecosystem.

This task is intended to elicit student learning of the following **NGSS elements** for each of the three dimensions:

Disciplinary Core Ideas

LS2.A-M1: Interdependent Relationships in Ecosystems

- Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.

Science and Engineering Practices

MOD-M6: Using Models

- Use a model to describe unobservable mechanisms.

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Crosscutting Concepts

SC-M1: *Stability and Change*

- Explanations of stability and change in natural systems can be constructed by examining changes over time and processes at different scales.

Helpful Prior Knowledge

Soil health is a critical foundation for environmental sustainability, agriculture, and biodiversity. Healthy soil supports plant growth, stores water, cycles nutrients, and stabilizes the ground. It is also teeming with life—organisms like bacteria, fungi, worms, and insects work together to maintain the soil's structure and fertility.

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Collaborations

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