



**Highland Support Project**



# SOIL SCHOOL

**A D.E.E.P Ecology Curriculum**

## *Soil School Purpose & Goals*

# What We Aim to Grow

### **Cultivate Ecological Literacy**

- Build foundational understanding of soil as a living, dynamic system essential to all life on Earth.
- Highlight the soil food web, microbial life, and the role of fungi, bacteria, and organic matter in healthy ecosystems.

### **Restore Human Relationships with Land**

- Reframe soil not as a “resource” but as a relative, shifting from anthropocentric to relational worldviews.
- Recognize the spiritual, cultural, and ethical significance of soil across traditions and generations.

### **Honor and Integrate Indigenous & Ancestral Knowledge**

- Uplift land stewardship practices rooted in Indigenous science and traditional ecological knowledge.
- Explore techniques like terra preta, IMO collection, and closed-loop nutrient cycles that reflect long-tested systems of regeneration.

### **Empower Regenerative Action**

- Equip learners with accessible, practical tools for composting, soil testing, and remediation.
- Foster confidence in applying DIY methods that restore soil health and community resilience.

### **Foster Systems Thinking and Biomimicry**

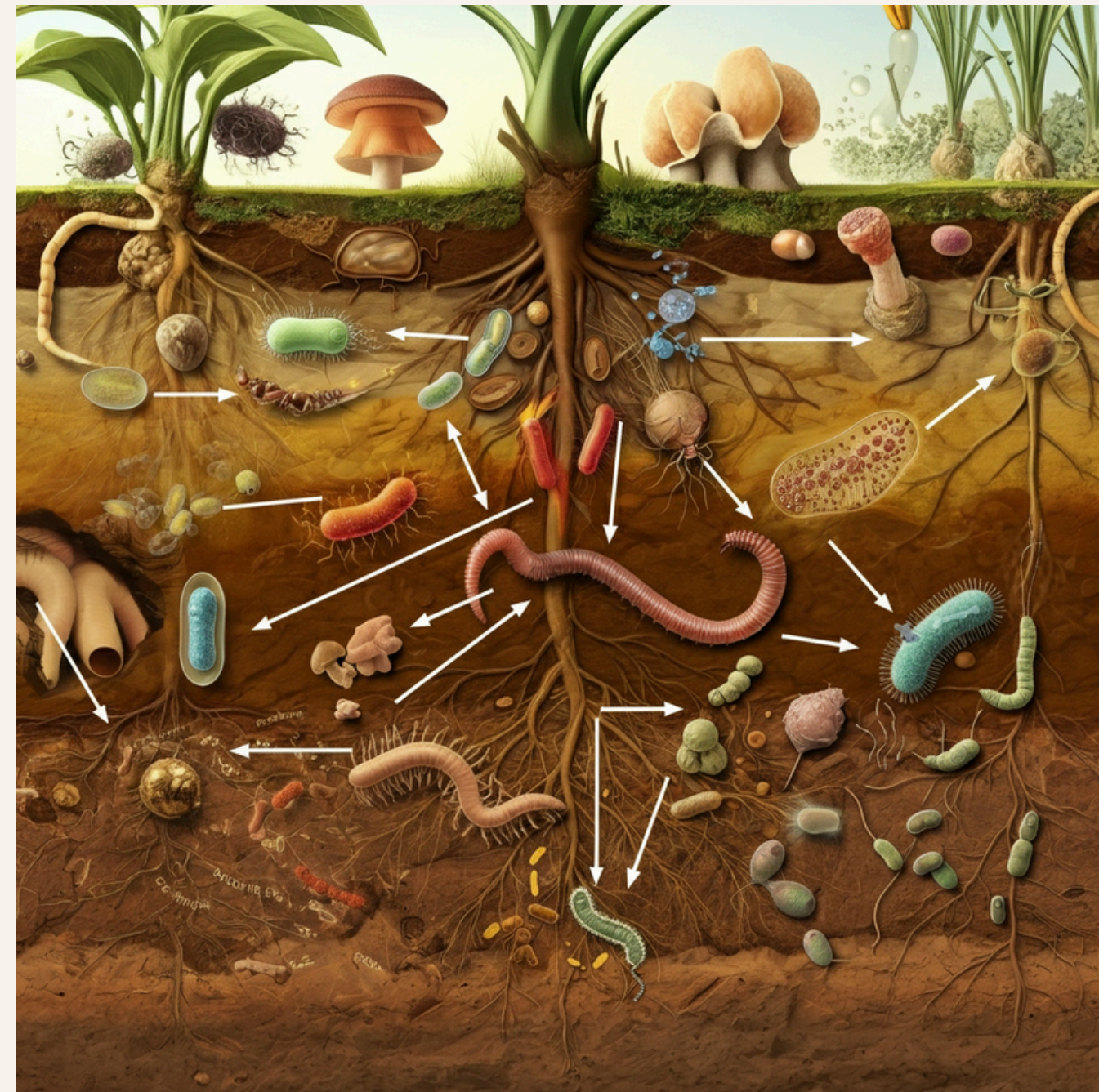
- Help students recognize patterns in natural ecosystems and mirror those in soil care (e.g., compost as nutrient cycling).
- Use biomimicry as a lens to design with nature, not against it.

### **Build Community Through Hands-On Learning**

- Encourage collaboration, creativity, and reflection in community work days, soil experiments, and restoration projects.
- Frame soil stewardship as both ecological practice and collective care.

# Soil as a living system

- Soil is not just dirt - it's a living, breathing ecosystem.
- Just like forests or coral reefs, soil hosts vast biodiversity: fungi, bacteria, protozoa, nematodes, arthropods, earthworms, and more.
- A teaspoon of healthy soil can contain more organisms than there are people on Earth.
- These organisms form the Soil Food Web- an interconnected system that cycles nutrients, filters water, and builds plant health.
- Healthy soils are foundational to food, water, air, and climate resilience.



# The Chemical Revolution & Desertification

- The Chemical Revolution (post-WWII agriculture) introduced synthetic fertilizers, pesticides, and tillage-intensive practices.
- These methods disrupted the soil food web, killed microbial life, and compacted the soil - leading to widespread degradation.
- Over time, this led to desertification: the process by which fertile land becomes barren and unable to support life.
- This transformation reflects a mindset rooted in anthropocentrism - where soil is treated as a passive resource rather than a living partner.
- Reviving the soil requires a shift in consciousness and recognizing soil's role in sustaining life.



# Terra Preta & Indigenous Soil Wisdom



- Terra Preta is a fertile, human-made soil found in the Amazon Basin, created by Indigenous peoples over 2,000 years ago.
- Composed of biochar, compost, food waste, and beneficial microbes, it remains incredibly fertile to this day.
- Indigenous knowledge systems understand soil as worthy of care, reciprocity, and respect.
- Modern soil renewal efforts like biochar, compost tea, and IMO collection are rooted in these traditions.
- By honoring and integrating Indigenous wisdom, we move from extraction to regeneration.

# Module 1: What Is Soil?

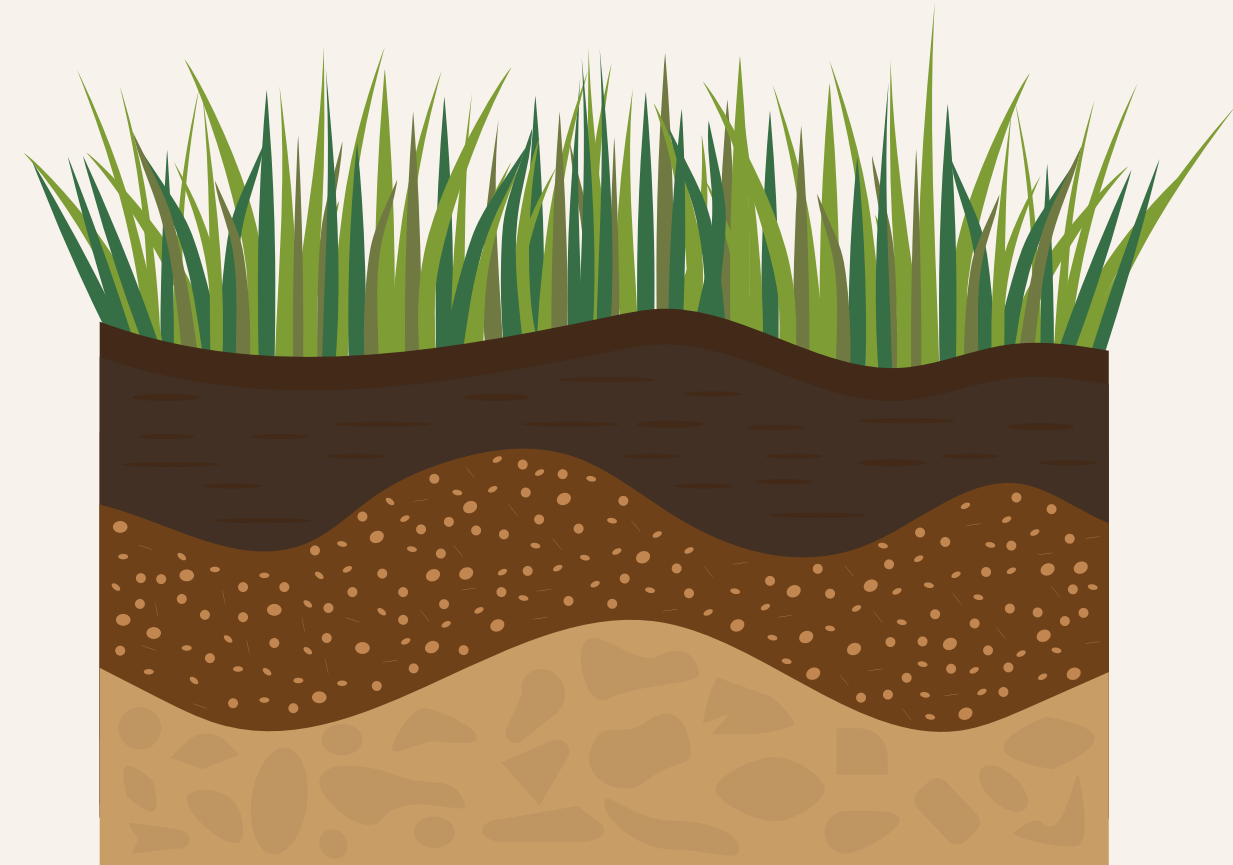
## Foundations & Physical Properties

### Objectives:

- Define soil and distinguish it from “dirt.”
- Identify the four main components of soil: minerals, organic matter, water, and air.
- Understand soil texture and how it affects water and air movement.
- Explore soil structure and soil horizons.

### Material to Teach:

- Soil ingredients: mineral particles, organic matter, water, air
- Texture: sand, silt, clay and their properties
- Structure: aggregates and porosity
- Soil horizons: O, A, B, C



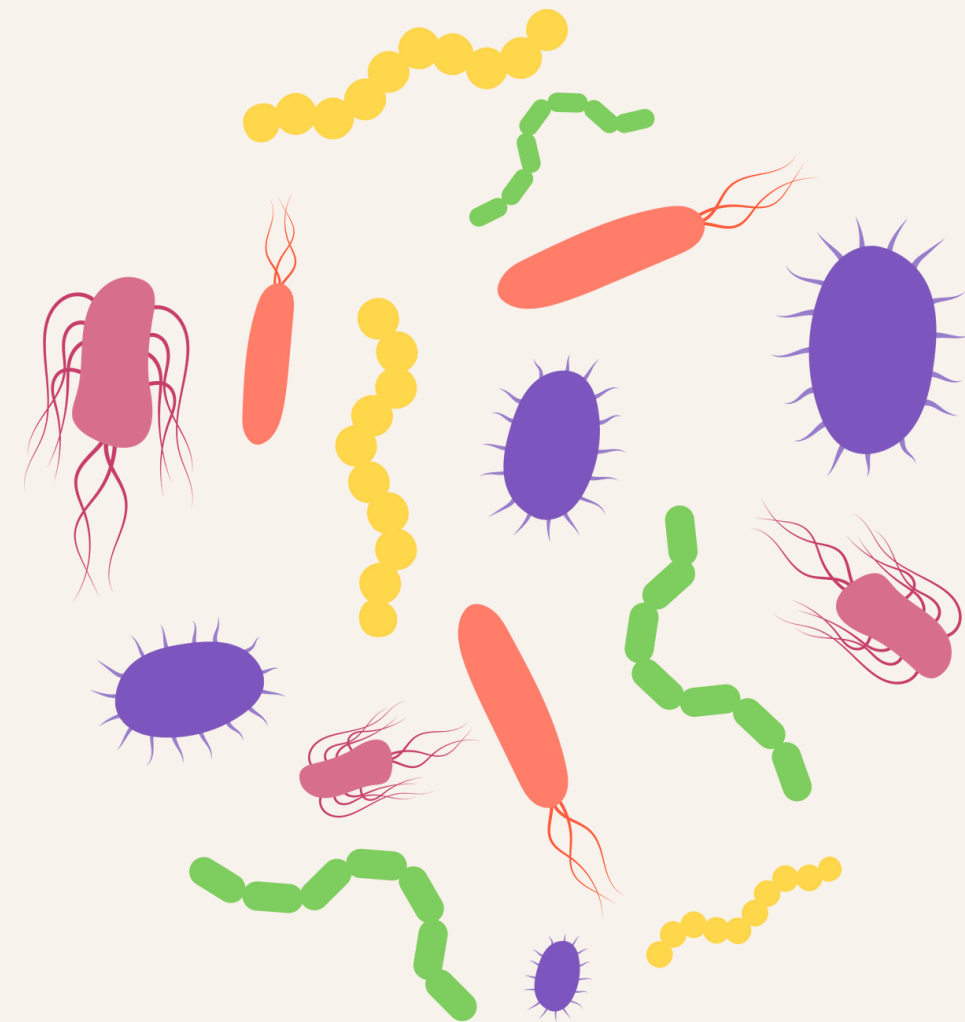
# Module 2: Soil as a Living System

## Objectives:

- Understand soil as a living, dynamic ecosystem.
- Explore microbial life and the soil food web.
- Recognize the role of fungi–plant–bacteria interactions.
- Appreciate soil biodiversity and its role in ecosystem health.

## Material to Teach:

- Soil food web: bacteria, fungi, protozoa, nematodes, arthropods
- Fungal networks (mycorrhizae) and plant communication
- Life in a teaspoon of soil: microbial biomass
- Microbial metabolism: respiration, nutrient cycling



# Module 3: Earth Ethics & Ancestral Knowledge

## Objectives:

- Explore Indigenous and ancestral soil practices rooted in reciprocity.
- Analyze the impacts of the Chemical Revolution on soil life.
- Understand biomimicry and closed-loop design as regenerative practices.
- Reframe soil as kin, not commodity.

## Material to Teach:

- Traditional Ecological Knowledge (TEK): Terra preta, milpa, polycultures
- Biomimicry: forest floor cycling, fungal partnerships, root webs
- History and impact of chemical fertilizers, pesticides
- Ethics of land care and stewardship



# Module 4: Soil Healing & Regeneration

## Objectives:

- Learn how to build living, fertile soil through composting and natural amendments.
- Explore microbial practices (including Indigenous knowledge) to restore soil life.
- Assess soil health using simple testing, observation, and local indicators.
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## Material to Teach:

- Composting fundamentals: C:N balance, decomposition, moisture, aeration
- Vermicomposting and worm castings
- Indigenous Microorganisms (IMOs): Collection, preservation, application
- Compost tea: Aerobic brewing and microbial introduction
- Soil remediation with biochar, wood ash, cover crops
- DIY soil testing for structure, pH, and microbial activity
- Biomimicry and closed-loop nutrient systems



# Applied Soil Ecology Activities

- Sorting Carbon & Nitrogen Sources
- Compost Tea Brewing
- Indigenous Microorganism (IMO) Collection
- Creating Biochar
- DIY Soil Testing (pH, texture, infiltration)
- Worm Bin Creation
- Soil Shake Jars (separating sand, silt, clay)
- Creating asagna compost piles
- Soil Observation Stations (color, smell, feel)
- Water Infiltration/Drainage Test
- Soil Food Web Mapping
- Microscopy or Magnifying Glass Exploration of Soil Life