



# Soil & Recycling Department

## Lesson 1 - Walking on Ecosystems

### Essential Questions:

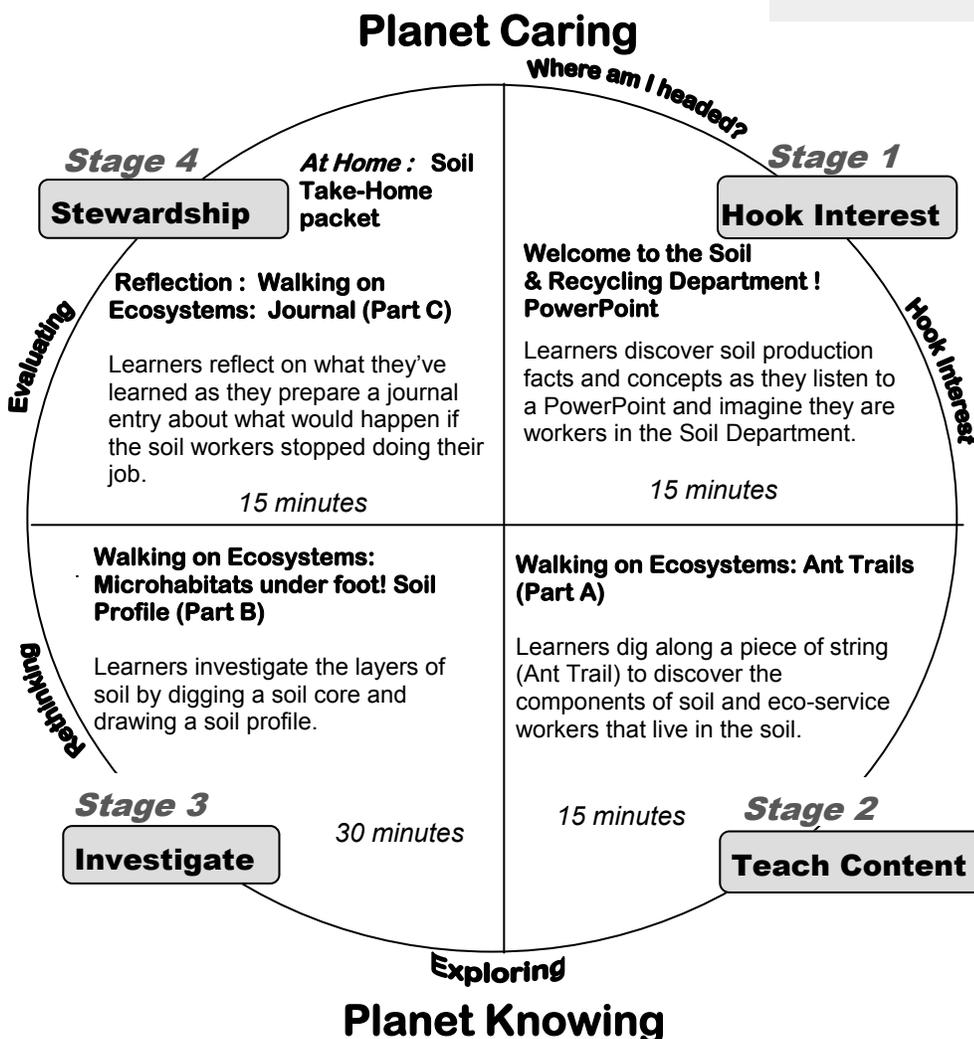
*What are the components of soil?  
Who are the workers in the Soil Production Department?  
How do these workers aid in breaking down plant and animal matter into soil?*

### At a Glance:

An interactive presentation (PowerPoint & dramatization) hooks learner interest and concern for the Soil Production Department (SPD) on their school site. Learners then move outside to explore the SPD close-up by digging along an 'Ant trail' to find the components of soil and its workers. Digging in the dirt continues with a soil profile study and a closer look at soil composition. The lesson ends with a reflection of what would happen if the soil workers stopped doing their job.

### Concepts:

- Physical and biological processes are responsible for soil formation.
- Soils are not considered a renewable resource.
- Soils are complex materials, containing both organic and inorganic components.
- Human activities can negatively affect water and soil conditions.
- Earthworms and decomposer insects are important soil producers.



### Objectives

*Learners ...*

- 1) demonstrate curiosity about the major concepts related to the Soil Department.
- 2) locate the different components of soil.
- 3) find and observe organisms in the soil.
- 4) measure the depth of each soil layer.
- 5) explore creative aspects of journaling.
- 6) discover the many organisms that live in the soil.

## PROCEDURES IN BRIEF: Soil Production Lesson 1—Walking on Ecosystems!

### Stage 1. Welcome to the Soil Production Department! *PowerPoint*

#### Procedure:

1. Start by introducing learners to some of the Soil Production Department workers by showing them the Eco-service cards.
2. Show the Soil PowerPoint.

Use the PowerPoint to introduce or refresh learners' understanding of soil production and also to focus their attention on the goals of the soil module.

Use the following concepts to review what was learned in the PowerPoint presentation:

- Physical and biological processes are responsible for soil formation.
- Soils are not considered a renewable resource.
- Soils are complex materials containing both organic and inorganic components.
- Human activities can negatively affect water and soil conditions.
- Earthworms and decomposer insects are important soil producers.

#### Supplies

- PowerPoint on CD
- Eco-Worker Cards
- Blow Fly
- Carpenter Ant
- Fire Ant
- Carrion Beetle
- Cockroach
- Dung Beetle
- Fungus
- Termite
- Daddy Long-legs
- Earthworm
- Millipede
- Pillbug
- Land Slug
- Land Snail

### Stage 3. Walking on Ecosystems: Microhabitats under foot! (Part B)

#### Procedure:

1. Explain to the learners that as soil breaks down and weathers, and as nutrients are washed deeper into the soil by water, the soil forms different layers.
2. Learners may continue in their same groups, at their assigned location.
3. Learners are to follow the instructions on their worksheet, digging a soil core at 1, 3, 6, and 8 inch increments to examine the soil layers, or horizons. Provide rulers for measuring the soil core depth.
4. At each layer/horizon of soil, learners are to list what they find in the space provided on their worksheet.
5. Learners are then to draw what is found in each horizon in the chart. Use crayons to show what color each horizon is.
6. After observing the soil profiles, place the soil and any organisms back where they came from.

#### Supplies

- pencils
- Walking on Ecosystems worksheet
- assorted brown, red, yellow, and orange crayons to match soil colors
- Ruler
- Pencil
- Hand lens
- several shovels or a soil auger for obtaining a soil core

### Stage 2. Walking on Ecosystems: Ant Trails! (Part A)

#### Procedure:

1. Choose three Checkpoint sites on the school site where you would like to study the soil and mark them on your site map.
2. Break the group into six smaller groups and have two groups gather the information at each site.
3. Pass out worksheets and magnifying glasses. Using compasses, each group at each site will decide to go North or South and note this on their worksheet.
4. Use an ant puppet (optional) to demonstrate how ants and other insects crawl through the soil and along the forest floor. Ask learners what the ant sees as it crawls along the forest floor or lawn.
5. Place a brightly colored string approximately nine feet long on the soil at your investigation site. Explain that children will pretend they are ants looking for the different components of soil as well as many organisms that live right under their feet.
6. Learners are to make a check mark next to the objects and organisms they find in the soil on their worksheet.
7. Allow 10-15 minutes for exploration.
8. Reassemble and ask children to share what they found. If available, use magnifying bug boxes to pass around any insects or other interesting organisms found.
9. Make sure that insects and other items found during the activity are returned to their forest homes.

#### Supplies

- ant trails - pieces of bright-colored string about nine feet long each
- Magnifying glasses
- compass
- Pencil
- Walking on Ecosystems worksheet
- ant puppet (optional)

### Stage 4. Walking on Ecosystems: (Part C) Journal Reflection

#### Procedure:

1. Discuss how soil is made and the role organisms play in soil production.
2. Give a brief overview of the journal entry.
3. Allow learners to find a quiet place outside with their journals and/or worksheet. To start, have learners record the date, time, and surroundings of their journal entry.
4. Give learners time to read through and complete the journaling activity (15-20 minutes).
5. Gather learners back together and allow those who want to share to discuss their journal entries.

#### Journal entry:

*Write a journal entry about the day the soil workers went on strike. What happened? What did the world look like? What happened to the plants?*

*Then discuss why we need the Soil Production Department and thank the workers for all they do.*

#### Supplies

- pencil
- Walking on Ecosystems worksheet or journal