

Garden Lesson: Nutrient Cycling

Season: Fall | Grades: 4th, 5th and 6th

Ohio Science Concept

- Grade 4 (LS): Earth's Living History- Environmental change
- Grade 5 (LS): Interactions within Ecosystems- Organisms perform a variety of roles in an ecosystem
- Grade 6 (ESS): Rocks, Minerals and Soil- Rocks, minerals and soil have common and practical uses

Science Inquiry and Application

- Observe, ask questions and communicate observations about the natural environment
- Employ simple equipment and tools to gather data and extend the senses
- Develop models
- Think critically and logically to connect evidence and explanations

Next Generation Science Standards

- 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction.
- 5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers and the environment
- MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Objectives

Students will...

- Identify and examine the decomposition process and make connections nutrient cycling in a food web
- Use observational skills to sketch and describe nutrient cycles in the garden
- Apply proper weeding and composting techniques to care for the garden

Materials

- *Observe Station:* samples of compost at different states of decomposition, arthropod identification sheets, tarps, hand lenses, popsicle sticks, student worksheets, pencils, clipboards
- *Explore Station:* clipboards, markers, student worksheets
- *Garden Station:* trowels, wheel barrow

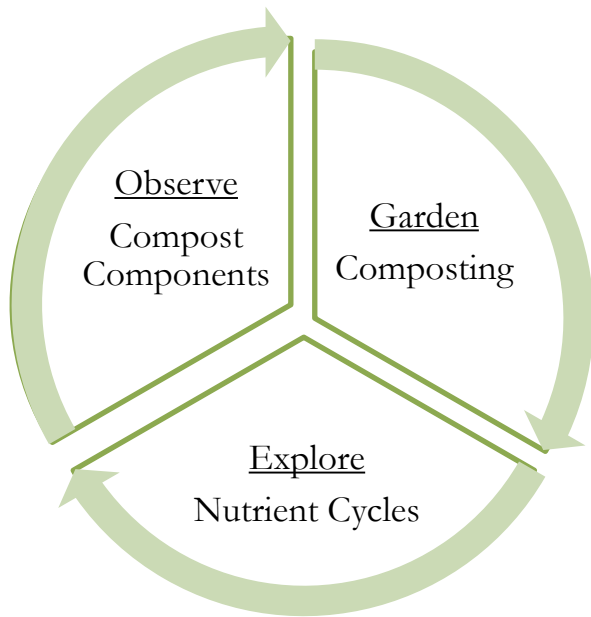
Overview

The focus of this lesson is nutrient cycling. At the Observe Station students use tools to identify components of the decomposition process occurring in compost and relate these components to the cycling of energy and elements. At the Explore Station students will demonstrate their understanding by drawing a pictorial representation of a nutrient cycle which they will present to their peers. At the Garden Station students will experience the concept of nutrient cycles in the garden by weeding and composting. The lesson will close with a group discussion about how students can apply what they've learned to help the environment.

5 minutes Introduction

- Welcome & review expectations
- How is soil formed? What happens in the compost?
- Break into three groups for stations

20 minutes Station Rotation (10 minutes per station)



Observe: Compost Components

- Materials: samples of compost at different states of decomposition, arthropod identification sheets, tarps, hand lenses, popsicle sticks, student worksheets, pencils, clipboards
- Prep: Divide the students into three teams & distribute materials
- Ask the students to explain what compost needs so decomposition can occur effectively, what we should put in the compost bin and the why the samples look different
- Using the tools available students should list the components they observe in their samples
- Have students fill out “Compost Components worksheet while using “Compost Critters” as an ID reference.

Explore: Nutrient Cycles (2 sets of materials)

- Materials: clipboards, markers, student worksheets
- Students will discuss how nutrients are recycled in the garden as plant parts are placed in compost and compost is broken down by decomposers into a soil like substance that can be used in the garden
- In groups, students will draw their own nutrient cycle cartoons and present them to the class

Garden: Composting

- Materials: trowels, wheel barrow
- Look for plants that don't belong in the garden (weeds or plants that have finished their life cycle)
- Pull these plants out of the garden and put them into the wheel barrow to be added to the compost
- Ask the students to explain what will happen to the plants in the compost pile over time

5 minutes Conclusion: What Can You Do?

- Ask students why composting is important
- What can they do to help the environment around the school and neighborhood?
- Ask if students have any questions

Source: "Do the Rot Thing" from CVSWMD Organics

COMPOST CRITTERS WORKSHEET

Circle Me If You Can Find Me



collembola



springtail



mite



sow bug



slug



worm cocoon



beetle



fruit fly



white worms



redworm



spider



snail



mold



ant



centipede



baeteria



millipede



pill bug

Name: _____ Date: _____

Observe Station Student Worksheet: Compost Components

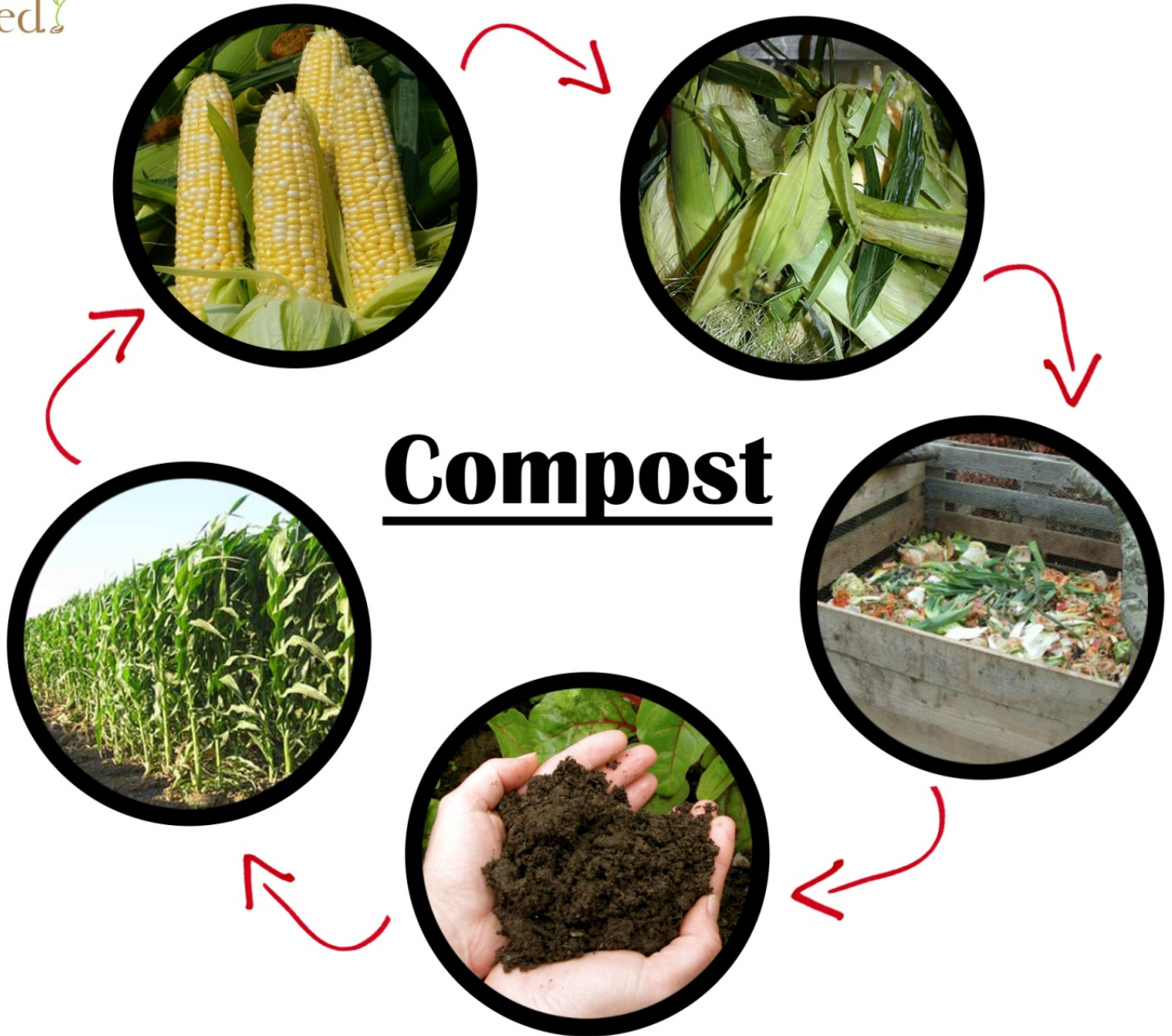
Directions: Use hand lenses and observational skills to compare and contrast compost components at different stages. Try to identify as many items as you can and sort into the categories of living or nonliving.

Stage of Compost _____

<u>Living</u>	<u>Nonliving</u>

Student Worksheet: Nutrient Cycle Example (Explore station)

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Student Worksheet: Nutrient Cycle Worksheet (Explore Station)

ed?

