

## DESCRIPTION

Students will continue working on their culminating Team Poster Project. Students will present their poster to the class and discuss key similarities and differences between aerobic compost, vermicompost, and bokashi.

**TIME:** 60 minutes

**SUBJECTS:** Science, Visual Arts, Language Arts

## LEARNING OBJECTIVES

After this lesson students will be able to:

- Compare and contrast, and discuss key elements, functions, and ingredients of each of the three composting systems.
- Design a team poster about aerobic compost, vermicomposting, or bokashi composting.

## ACADEMIC STANDARDS\*

**CCSS, Language Arts:** 3.RF.3, 3.W.1, 3.W.2, 3.W.10, 3.SL.1 **NGSS:** 3-LS4-3., 3-5-ETS1-2., LS4.C., ETS1.B., Systems and Systems Models, Influence of Science, Engineering and Technology on Society and the Natural World, Obtaining, Evaluating, and Communicating Information, Patterns, Systems and System Models **Lesson Extensions:** 3.W.1, 3.W.2, 3.SL.1, 3.SL.4

\*A detailed list of the Academic Standards can be found in the Unit Overview document.

## LESSON OUTLINE

- I. Introduction (5 minutes)
  1. Group Activities Overview
- II. Group Activities (45 minutes)
  1. Final Preparation (15 minutes)
  2. Team Poster Project Presentations (30 minutes; 10 minutes per group)
- III. Closing & Snack (10 minutes)

## KEY TERMS AND CONCEPTS

**Aerobic** - Refers to the presence of air (oxygen)

**Anaerobic** - Refers to the absence of air (oxygen)

**Bacteria** - Unicellular organisms; widely distributed in soil, water, air, and on or in the tissues or plants and animals

**Beneficial Microorganisms** - Naturally-occurring plant and soil microorganisms that can be cultivated and applied to improve plant health and the recycling of soil nutrients

**Bokashi** - A Japanese term meaning “fermented organic matter;” a method of composting that uses beneficial microorganisms to ferment and accelerate the breakdown of organic matter

**Compost** - Decayed organic matter; used to improve soil texture and fertility

**Compost Pile** - A heap of vegetation and other organic matter that is decomposing to become compost

**Decomposers** - Organisms that break down dead or decaying material and carry out decomposition

**Fungi** - Plural of fungus; spore-producing organisms that feed on organic matter; includes molds, yeast, mushrooms, and toadstools

**Invertebrate** - An animal lacking a backbone, such as an insect (arthropod) or a worm (annelid)

**Mindful** - Conscious or aware of something, to focus attention on the present moment

**Organic Matter** - Material that is either living or that originated from life

**Nutrient Cycle** - The movement and exchange of organic and inorganic matter (e.g., minerals) back into the production of living matter

**Vermicomposting/Vermiculture** - A system that uses composting worms to convert organic matter into vermicompost/vermicast

# LESSON MATERIALS

**Lesson Supplies:**

- Garden Agreements Sign
- Students' Team Posters from Lesson 7 (3 per class)
- Student Worksheet: Team Poster Project from Lesson 7
- Nutrient Cycle Sign
- Student Workbook

**School to Provide:**

- Markers, crayons, coloring pencils

**ACCOMPANYING DOCUMENTS**

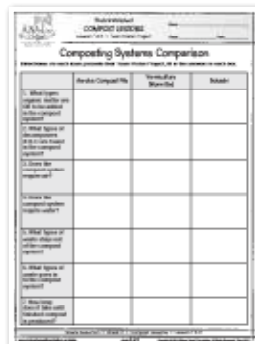
- Student Worksheet: Team Poster Project
- Student Worksheet: Composting Systems Comparison
- Student Worksheet: Reflection
- ĀINA Post-Unit Survey

**ADVANCE PREPARATION**

- One week prior to the lesson, remind teachers to have students work on their poster presentations.
- Discuss lesson preparation and presentation plans with your teaching team.
- Locate the student worksheets and student team posters from Lesson 7.
- Make copies of the Reflection Student Worksheet, one per student if not using the Student Workbooks.
- Harvest or purchase and prepare the fruit and/or vegetable snack.



Team Poster Project  
Student Worksheets



Compost Systems  
Comparison Student  
Worksheet



Nutrient Cycle Sign

## INTRODUCTION

5 MINUTES

“Aloha! Today is our final ĀINA In Schools composting lesson of the school year. We have explored many different topics: three types of composting, the nutrient cycle, decomposition, and decomposers such as the FBI. Last lesson after the Compost Systems Review Game, you started to create a team poster. Today you will put the finishing touches on your posters and presentations and present your ideas to our class.”

### GROUP ACTIVITIES OVERVIEW

“We are going to continue working on your poster in our three groups: Aerobic Composting, Vermicomposting, and Bokashi.” Have students get their worksheets and posters.

**Your task today as a team is to complete the following. Start where you left off from the last lesson:**

1. Circle your team’s compost system.
2. Your teacher will assign you a job from the list. Write each team member’s name next to their job. Each team member will complete the worksheet for their assigned job then work together to create a team poster to share during your class presentations.
3. Assemble your compost poster as a team and plan your presentation.
4. Practice your presentation until you are confident with presenting your job in front of a group.

### DOCENT TIP

One docent should be assigned to each student group to provide support and help with their design plan and presentation. Assign each student to a job. Support students through completing their job on the worksheet and half sheet of paper. Ensure they feel comfortable and prepared to present their answer during the presentation.

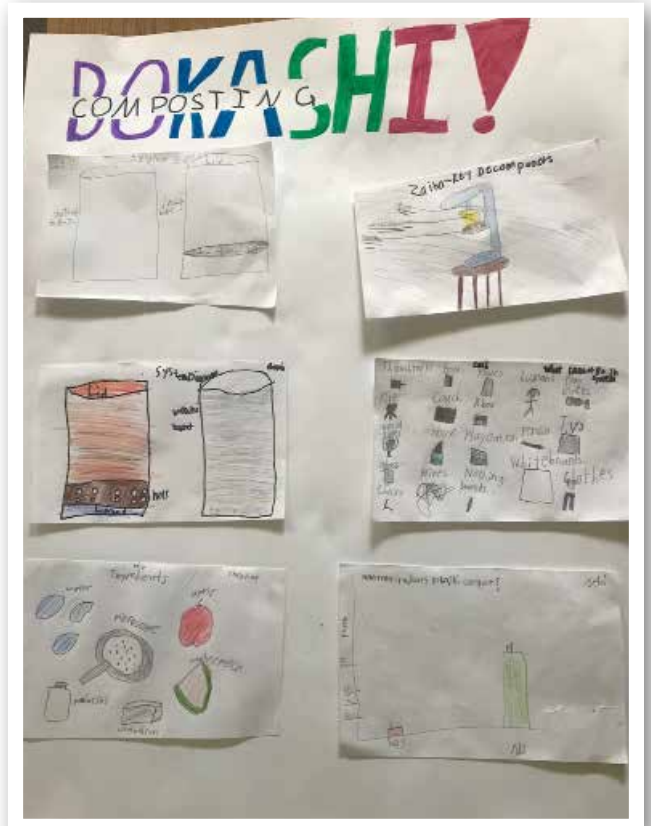
### Garden Agreements

Have students take a deep breath, then repeat and discuss the Garden Agreements as listed on the Garden Agreements Sign:

- I will be SAFE
- I will be KIND
- I will have an OPEN MIND
- I will use my TIME WELL



Divide class into their three Aerobic Composting, Vermicomposting, and Bokashi groups. Have students bring their color pencils, crayons, or markers.



## GROUP ACTIVITIES

45 MINUTES

### FINISHING TOUCHES (15 minutes)

Each team will spend 10 minutes putting the finishing touches on their poster and preparing for their presentation.

### TEAM POSTER PROJECT PRESENTATIONS (30 minutes)

Provide 10 minutes for each team to share their poster and presentation with the class. All team members should stand together and each member should participate in the presentation. Allow students to use their worksheets as reference to share about their assigned jobs.

Gather all students to prepare for their group presentations. "This year we have been practicing being MINDFUL, being conscious or aware of something, to focus attention on the present moment. How can you be mindful when each team is presenting their compost design plan?" Take a few answers. During the presentations, have students follow along on their Compost Systems Comparison Worksheet on page 26 of their Student Workbook.



## CLOSING & SNACK

10 MINUTES

Gather all the students together and serve the snack. Ask them to share about their experience.

Discuss with students:

- Describe how composting helps their school campus and the larger nutrient cycle.
- What did you love most about your composting experience this school year?
- Which compost system was your favorite?

Be sure that students have washed their hands thoroughly with soap and water, then share the fruit and/or vegetable snack with students. Ask them to share what they are thankful for before enjoying the snack, and reflect on the nutrient cycle that has contributed to the growth of these healthy fresh fruits and vegetables and all of the plants and foods that we eat, as well as our role in working with nature to continue the nutrient cycle through composting!



Nutrient Cycle Sign

## FOLLOW UP COMPOST CARE

**Follow Up Compost Care is the responsibility of the classroom teacher and students.**

- Continue to have students care for the aerobic compost pile(s) and worm bin(s) as described in the Follow Up sections of Lessons 5 and 6.



## FOLLOW UP ACTIVITIES

**Follow Up Activities are the responsibility of the classroom teacher.**

- Provide detailed feedback to each of the student groups. Let each team revise and enhance their presentations and posters. Give the students the opportunity to present their compost posters to different audiences such as different grade level classrooms, administration, community gatherings, student conferences, etc. Post the final posters around campus for the rest of the school to see the possibilities of a school-wide compost plan!
- Review this year's composting experience with students, including key concepts for the unit, which are 'āina, aerobic composting, vermicomposting, bokashi, aerobic and anaerobic conditions, organic matter, soil F.B.I. (fungi, bacteria, and invertebrates), microorganisms, decomposition and decomposers, fermentation, the nutrient cycle, and mindfulness.
- Have students complete the Reflection Student Worksheet and/or create a final journal entry about their composting experience this semester. Have them share their work with the class.
- Have students complete the Post-Unit Survey
- Save and submit examples of student work to Kōkua Hawai'i Foundation.

## LESSON EXTENSIONS

**Waste-Free World: Campaign For Composting!**  
(3.W.1, 3.W.2, 3.SL.1, 3.SL.4)

1. What if there was no such thing as waste? Have students create posters about their vision for a waste-free world, including stories, poems, songs, drawings, collages, comic strips, plays, etc.
2. Post their creations around campus. Have students present their vision to the school community.
3. As a class, create a "road map" of steps that it would take to create a waste-free world. Then, start taking them! Help your entire school to do the same. Create a pledge that families can make for this purpose.
4. Have students write to their elected representatives, waste department, local newspapers, and other media outlets about their visions and actions for a waste-free world.

