



Growing healthy keiki, schools, and communities  
A program of the Kōkua Hawai'i Foundation

# COMPOST LESSONS

## Student Workbook

### Grade 3

Student's Name: \_\_\_\_\_

Teacher's Name: \_\_\_\_\_

Date: \_\_\_\_\_

[www.kokuahawaiifoundation.org/aina](http://www.kokuahawaiifoundation.org/aina)



A program of the Kōkua Hawai'i Foundation

A farm to school program connecting children to their land, waters, and food to grow a healthier Hawai'i

ĀINA In Schools is a farm to school initiative launched in 2006 that connects children to their local land, waters, and food to grow a healthier Hawai'i. In addition to encouraging the use of locally grown fruits and vegetables in school meals and snacks, the program includes a standards-based nutrition, garden, and compost curriculum that empowers children to grow their own food, make informed food decisions, and reduce waste. ĀINA In Schools also promotes field trips to local farms, chef cooking demonstrations in classrooms, as well as waste reduction, garden, and cooking educational opportunities for families and community members.

## Six Integrated Program Components

### Core components:

- **Nutrition Education** empowers students to try new foods and make healthy choices that will last a lifetime.
- **Garden-Based Learning** transforms the school garden into a learning laboratory where all subjects are explored.
- **Healthy Food on Campus** increases local, fresh products in school lunches and snacks to provide healthy choices and support local farms.

### Additional components:

- **Agricultural Literacy** introduces students to where their food comes from and who grows and prepares their food.
- **Waste Reduction** reduces, reuses, and recycles waste in gardens, schoolyards, cafeterias, and classrooms.
- **Family & Community Outreach** raises awareness to support student, family, and community health and wellness.



## ĀINA In Schools Curriculum

- The ĀINA In Schools curriculum includes 8 lessons per year for grades K-6 that are standards-based, multi-subject, and hands-on. The curriculum supports a variety of learning styles and covers topics from the Nutrition, Garden, and Waste Reduction components. Successive units enable students to build on previous knowledge while developing a solid foundation in 'āina-based systems thinking. Nutrition and garden lessons also include close to the source, healthy snacks that reinforce key concepts.
- ĀINA In Schools Curriculum Trainings for Educators and online access to all materials via the Kōkua Hawai'i Foundation website enable educators to bring the ĀINA In Schools experience to students throughout Hawai'i and beyond. Lessons meet Common Core and HCPSIII standards for grades K-6 and are easily adaptable for other grades.

"As an educator, I appreciate your program on so many levels. Your program does more than simply address state standards, but gives our students meaning and relevance as they study and engage in a living classroom where they literally see the fruits (and vegetables!) of their labor."

School Principal

## Key KHF Farm to School Partnerships

- Co-leader and founding partner of the **O'ahu Farm to School Network**: [www.oahufarmtoschool.org](http://www.oahufarmtoschool.org).
- Founding member of the **Hawai'i Farm to School & School Garden Hui**: [www.hawaiischoolgardenhui.org](http://www.hawaiischoolgardenhui.org).
- Hawai'i Core Partner for the **National Farm to School Network**: [www.farmtoschool.org](http://www.farmtoschool.org).
- Kōkua Hawai'i Foundation is also an Advisory Committee member of the **Hawai'i Environmental Education Alliance**: [www.heea.org](http://www.heea.org).

ĀINA In Schools is a program of the Kōkua Hawai'i Foundation



[www.kokuahawaiifoundation.org/aina](http://www.kokuahawaiifoundation.org/aina)

I have been at this school since grade: K 1 2 3 (circle one)

*This Pre-Unit Survey is to see what you already know about these topics. It is ok if you don't know any of the answers. You will be learning about these topics this year. Try your best and have fun!*

**1. Composting is breaking down organic material into smaller parts.**

**Circle:** True or False

**2. Circle which items can be put into an aerobic compost pile. Circle all that apply:**



Bread      Soil      Dried Leaves      Banana peels      Cheese      Orange peels      Plastic bottles



Cardboard      Aluminum cans      Sticks      Bottle caps      Water      Chicken bones      Green Leaves

**3. Circle which items can be fed to composting worms. Circle all that apply:**



Bread      Soil      Dried Leaves      Banana peels      Cheese      Orange peels      Plastic bottles



Cardboard      Aluminum cans      Bottle caps      Water      Chicken bones      Shredded Paper

**4. What decomposers break down organic matter? Circle ONE answer:**

- a. Fungi, Bacteria, Invertebrates
- b. Water, Nitrogen, Carbon
- c. Wheat Mill Run, Molasses, Beneficial Microorganisms

**5. Circle ONE answer. After organic matter is composted, nutrients are returned to the:**

- a. Air
- b. Water
- c. Soil

**6. Which composting method is best for composting leftover meat & bones? Circle ONE answer:**

- a. Aerobic compost pile
- b. Vermiculture (worms)
- c. Bokashi

7. Do you like gardening? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

8. Do you like eating fruits and vegetables? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

9. Do you like cooking? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

10. Do you like making compost? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

11. Do you like 'ĀINA Lessons? Circle ONE answer:

- a. I do not like
- b. unsure
- c. I like a little
- d. I like a lot

12. Do you and your family grow any food at home? Circle: Yes or No

If yes, please list the foods you grow at home: \_\_\_\_\_

13. Do you compost at home? (compost pile, worm bins, or bokashi bucket) Circle: Yes or No

14. How often do you eat fruits and vegetables? Circle ONE answer:

- a. I don't eat fruits and vegetables
- b. 1-2 times a week
- c. 3-5 times a week
- d. Every day

15. Circle the fruits and vegetables that you like to eat:

- Apple    Cantaloupe    Banana/Mai'a    Blueberries    Avocado    Coconut/Niu    Guava    Dragonfruit
- Mango    Passionfruit/Liliko'i    Honeydew    Rambutan    Tangerine    Strawberry    Blackberries
- Lemon    Starfruit    Breadfruit/'Ulu    Lychee    Orange    Papaya    Pineapple    Watermelon
- Radish    Spinach    Basil    Beans    Broccoli    Squash    Zucchini    Sweet Potato/'Uala    Corn    Tomato
- Lettuce    Watercress    Taro/Kalo    Cucumber    Green Beans    Asparagus    Carrots    Celery    Kale

Other: \_\_\_\_\_

16. Describe what 'āina means to you: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

17. List two ways that you take care of the 'āina:

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_

18. Complete the following sentence:

My favorite thing about 'ĀINA In Schools Lessons is \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Dear Parent or Caregiver:

This semester, 3rd graders will be participating in the first four of eight Compost Lessons being delivered by volunteers of 'ĀINA In Schools, a program of Kōkua Hawai'i Foundation. 'ĀINA In Schools is a farm to school initiative that connects children to their local land, waters, and food to grow a healthier Hawai'i. Program components vary from school to school and include nutrition education, garden-based learning, farm field trips, chef visits, waste reduction, and family and community outreach.

Although the lessons are delivered once a month, the students will be continually engaged in between lessons with regular compost activities that include data gathering for the Weekly Aerobic Compost Log, Vermiculture Log, and Daily Bokashi Log worksheets, feeding worms, adding more material to the compost pile, and checking Bokashi drainage.

Photos and Media Releases: By now each of you should have received a Kōkua Hawai'i Foundation Media Release Form. We hope that you have this form and have submitted it to your child's classroom teacher. From time to time, KHF takes photos/videos of our lessons to highlight activities that are noteworthy.

To keep yourself up to date on what your child is doing in 'ĀINA, we suggest putting this up on your refrigerator or bulletin board and follow up as the lessons are delivered. You can help reinforce, engage, and learn along with your child by going over the lessons and activities after each lesson. A lesson summary and suggested questions/activity for each lesson are listed below.

## Mahalo!

In the **Composting** unit, students will discover the theory and practice of three different types of composting systems: aerobic composting, vermicomposting, and bokashi composting. They will create, maintain, and harvest all three types of systems in order to reduce waste, recycle nutrients, and nourish the garden soil and plants. Key concepts for the unit include 'āina, aerobic and anaerobic conditions, organic matter, soil F.B.I. (fungi, bacteria, and invertebrates), microorganisms, decomposition and decomposers, bokashi, fermentation, the nutrient cycle, and mindfulness.



## Lesson 1 - Aerobic Composting: Theory and Building

In this lesson, students discuss compost, organic matter, microorganisms, and the soil F.B.I. (fungi, bacteria, and invertebrates). They discover the main ingredients for creating an aerobic compost pile, as well as what not to include. They collect, process, and layer plant materials to create an aerobic compost pile.



### Questions to discuss with your child:

- Why is composting important?
- Who are the soil F.B.I. and why are they important?

### Suggested home activity:

- Start an aerobic compost pile. To get started and for more info, read the 'ĀINA How to Create Aerobic Compost on our website: [kokuahawaiiifoundation.org/resources/category/aina\\_how\\_tos](http://kokuahawaiiifoundation.org/resources/category/aina_how_tos)

## Lesson 2 - Vermicomposting: Bin Setup

In this lesson, students review aerobic composting, discuss decomposition, and discover the steps for creating and maintaining a vermicomposting system. They build and maintain a worm bin in order to recycle fruit and vegetable waste and create a nutrient-rich, living fertilizer for the garden soil and plants.

### Questions to discuss with your child:

- What types of decomposers live in a worm bin?
- What are the main ingredients in a vermicomposting system?



### Suggested home activity:

- Start a vermicomposting system. To get started and for more info, read the 'ĀINA How to Create a Vermicomposting System, on our website: [kokuahawaiiifoundation.org/resources/category/aina\\_how\\_tos](http://kokuahawaiiifoundation.org/resources/category/aina_how_tos)

## Lesson 3 - Anaerobic Composting: Bokashi Prep

In this lesson, students will discover a third method of composting called bokashi, which utilizes Effective Microorganisms (EM) to ferment and decompose organic matter in an anaerobic (without air) environment. Students make a fresh batch of bokashi, then use finished bokashi to compost food waste from their school cafeteria, which will be buried in the garden soil or compost pile two weeks later during Lesson 4.



### Questions to discuss with your child:

- Who are the soil "F.B.I.?"
- Describe the soil food web.

### Suggested home activity:

- Compost using Bokashi. To get started and for more info, read the 'ĀINA How to Bokashi, on our website: [kokuahawaiiifoundation.org/resources/category/aina\\_how\\_tos](http://kokuahawaiiifoundation.org/resources/category/aina_how_tos)

## Lesson 4 - Anaerobic Composting: Bokashi Use

In this lesson, students review bokashi composting and discuss the nutrient cycle. They dry the bokashi made during Lesson 3 for later use, and bury the fermented food waste also created during Lesson 3 in the garden soil or aerobic compost pile in order to complete the bokashi composting process.



### Questions to discuss with your child:

- Describe the nutrient cycle and explain its importance.
- What did the fermented food waste look like when buried in the garden/compost pile?

### Suggested home activity:

- For a nutrient rich soil, use finished bokashi in your garden. For more info, refer to the 'ĀINA How to Bokashi on our website: [kokuahawaiiifoundation.org/resources/category/aina\\_how\\_tos](http://kokuahawaiiifoundation.org/resources/category/aina_how_tos)

If you have any questions or are interested in becoming an 'ĀINA In Schools docent, please do not hesitate to ask.

To learn more about 'ĀINA In Schools at your child's school, please contact your school's 'ĀINA Team Coordinator, or contact:



'ĀINA In Schools  
[aina@kokuahawaiiifoundation.org](mailto:aina@kokuahawaiiifoundation.org)

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## Lesson 5 - Aerobic Composting: Harvest

In this lesson, students review the key concepts of aerobic composting and importance of the F.B.I. (fungi, bacteria, and invertebrates). They will harvest compost from the pile that was created during Lesson 1, observe and record the invertebrates found, and add finished compost to the gardens on campus. They will chop and layer organic matter in order to create a new aerobic compost pile.

### Questions to discuss with your child:

- What does F.B.I. stand for and why are they important?
- How does it feel to work with nature through composting?



### Suggested home activity:

- For harvesting info, read the 'ĀINA Resource Sheet *How to Create Aerobic Compost* on our website: [kokuahawaiifoundation.org/resources/category/aina/how\\_tos](http://kokuahawaiifoundation.org/resources/category/aina/how_tos)

## Lesson 6 - Vermicomposting: Harvest

In this lesson, students review decomposition and the elements of a healthy vermiculture system, then harvest finished vermicast from their worm bin and learn how to use the vermicast to feed their garden soil and plants.

### Questions to discuss with your child:

- What types of decomposers did you observe today?
- How does vermicast contribute to healthy soil?

### Suggested home activity:

- For harvesting info, read the 'ĀINA Resource Sheet *How to Create a Vermicomposting System* on our website: [kokuahawaiiifoundation.org/resources/category/aina\\_how\\_tos](http://kokuahawaiiifoundation.org/resources/category/aina_how_tos)



## Lesson 7 - Team Poster Project: Part 1

In this lesson, students will be introduced to their culminating compost systems group project. Students use prior knowledge and skills gained throughout the year to design a comprehensive aerobic compost, vermicomposting, or bokashi compost system poster to present to their class.



### Questions to discuss with your child:

- What compost system is your team designing a poster for?
- What is your role in your team?
- How did you practice being mindful today?

### Suggested home activity:

- Compare the three composting systems learnt this year using the 'ĀINA Resource Sheets on our website: [kokuahawaiiifoundation.org/resources/category/aina\\_how\\_tos](http://kokuahawaiiifoundation.org/resources/category/aina_how_tos). Discuss what composting system(s) would be best for your household.

## Lesson 8 - Team Poster Project: Part 2

In this lesson, students complete their culminating compost systems group project. Students present their compost posters to the class and discuss key similarities and differences between aerobic composting, vermicomposting, and bokashi composting.



### Questions to discuss with your child:

- What are you most proud of about your compost system poster?
- What did you like most about your composting experience this school year?

### Suggested home activity:

- Select one of the three composting systems to create in your household. Have your child teach the family the benefits of the selected compost system.

If you have any questions or are interested in becoming an 'ĀINA In Schools docent, please do not hesitate to ask.

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'ĀINA In Schools  
Program



[aina@kokuahawaiiifoundation.org](mailto:aina@kokuahawaiiifoundation.org)



**I WILL BE SAFE**

\*

**I WILL BE KIND**

\*

**I WILL HAVE  
AN OPEN MIND**

\*

**I WILL USE  
MY TIME WELL**

Healthy soil makes healthy plants,  
Healthy plants make healthy food,  
Healthy food makes healthy people,  
Healthy people have good attitudes.



It's time to get back down,  
Underground to the microorganism town,  
We got old dead leaves and sticks from trees and bugs all around,  
A lot of decomposing going down.



We got the FBI, fungi, bacteria, and invertebrates,  
They're breaking down organic matter back into the soil,  
So the roots can have a taste.

Because healthy soil makes healthy plants,  
Healthy plants make healthy food,  
Healthy food makes healthy people,  
Healthy people have good attitudes



Compost that's the way to get the most,  
Nutrients back in the soil,  
Compost that's the way to get the most,  
Nutrients back in the soil,  
Go compost.



By Jack Johnson

Link for digital track download: [www.kokuahawaiifoundation.org/audio](http://www.kokuahawaiifoundation.org/audio)



## Key Terms and Concepts

**‘Āina** - Land; that which feeds, nourishes, and sustains us (e.g., food, water, air)

**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

**Decomposition** - The process by which a material is broken down into simpler forms of matter

**EM<sup>®</sup>** - Effective Microorganisms<sup>®</sup>; a specific group of naturally-occurring microorganisms including lactic acid bacteria, yeast, and phototrophic/ photosynthetic bacteria

**F.B.I.** - An acronym for the decomposers: Fungi, Bacteria, and Invertebrates



## Key Terms and Concepts

**Fermentation** - The breakdown of materials into simpler components by bacteria, yeasts, or other microorganisms without the use of oxygen

**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)

**L.A.W.** - An acronym for the ingredients in a compost system: Life/Organic Matter, Air, and Water

**Leachate** - Liquid that comes out of the drain of a worm bin; pour back into the bin or dilute with water and add to soil around trees; do not use on edible plant parts (e.g., lettuce leaves)

**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

**Vermicast/Vermicompost** - Also known as worm castings or worm poop; used as a nutrient-rich, living fertilizer; contains water soluble nutrients that are relatively easy for plants to absorb; contributes to microbial life and nutrient cycling in the soil

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

**Worm Tea/Vermicast Tea** - The liquid concentrate of vermicast, containing microbes, fine particulate organic matter, and soluble nutrients; aerobically brewed by steeping or mixing finished vermicast in water and aerating for 12 to 24 hours



# COMPOST LESSONS

Name .....

Lesson 1 \* Aerobic Composting: Theory & Building Class ..... Date .....

## KEY TERMS AND CONCEPTS

Aerobic

‘Āina

Bacteria

Compost

Compost pile

Decomposers

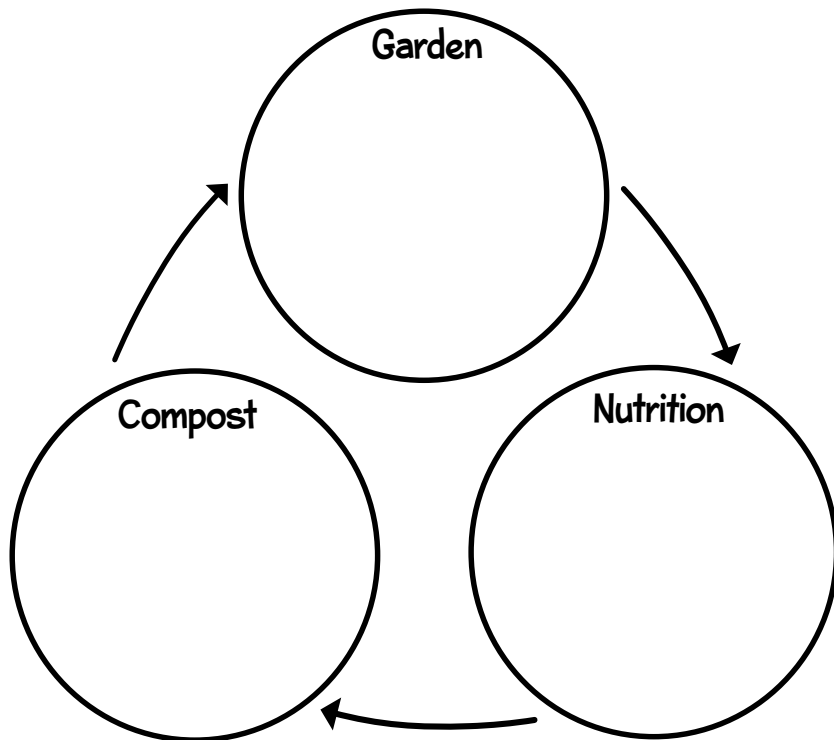
Fungi

Invertebrates

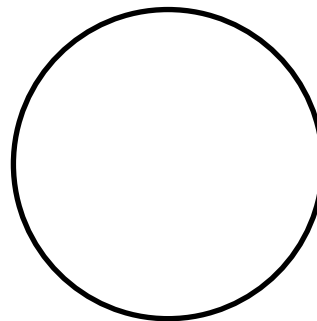
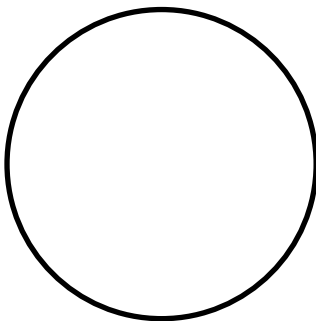
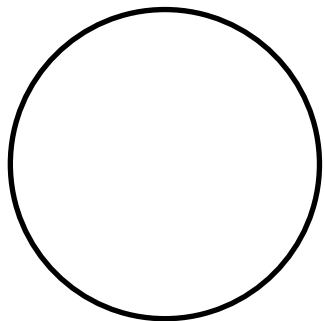
Microorganisms

Organic matter

1. **HEALTHY LIFE CYCLE.** Draw a picture of healthy plants, healthy food, and healthy soil in the circles.



2. **THE SOIL FBI:** Decomposers that work together to break down organic matter. What does F.B.I. stand for? Draw a picture in each circle.



F \_\_\_\_\_

B \_\_\_\_\_

I \_\_\_\_\_

3. Draw a star next to the **MICROORGANISMS** (The decomposers that are too small to see).

# COMPOST LESSONS

4. MAIN AEROBIC COMPOST PILE INGREDIENTS. What does L.A.W. stand for? Fill in the blanks with examples.

L \_\_\_\_\_ /organic matter

Carbon: \_\_\_\_\_

Nitrogen: \_\_\_\_\_

Decomposers: \_\_\_\_\_

A \_\_\_\_\_

W \_\_\_\_\_

5. Use crayons and color the aerobic compost pile ingredients below.

carbon (brown): sticks, branches, dried leaves, wood chips, shredded paper

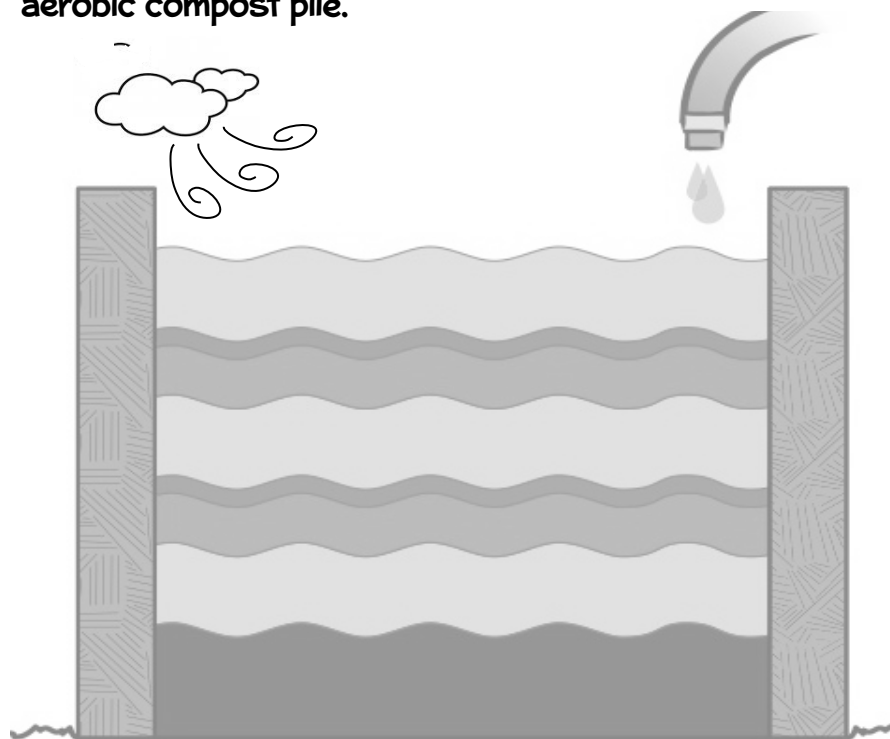
nitrogen (green): green leaves, grass clippings, fruit waste, vegetable waste

decomposers (pink) : fungi, bacteria, invertebrates

Air (white)

Water (blue)

6. Label and color the ingredients and layers of the aerobic compost pile.



7. Cross out the ingredients that stay out of the aerobic compost pile.

- chemicals
- dairy
- fish
- fruit and vegetable waste
- glass
- grass clippings
- meat
- metals
- plastics
- processed foods
- sticks
- worms



# COMPOST LESSONS

## Lesson 2 \* Vermicomposting: Bin Setup

Name .....

Class ..... Date .....

### KEY TERMS AND CONCEPTS

Aerobic

Decomposers

Decomposition

Leachate

Mindful

Vermicast/Vermicompost

Vermicomposting/

Vermiculture

Fill in the blank.

1. When there is a presence of air (oxygen) the compost system is \_\_\_\_\_.

2. The organisms that live in our composting systems are called \_\_\_\_\_.

3. A system that uses composting worms to convert organic matter into vermicompost/vermicast is called \_\_\_\_\_.

4. What are the key ingredients to a healthy vermiculture system?

**L** \_\_\_\_\_/organic matter

Carbon: \_\_\_\_\_

Nitrogen: \_\_\_\_\_

Decomposers: \_\_\_\_\_

**A** \_\_\_\_\_

**W** \_\_\_\_\_

5. Draw and label the main ingredients in the vermiculture (worm bin):

**What goes in:**

LIFE/Organic Matter

carbon: shredded paper, cardboard, egg cartons

nitrogen: clean fruit scraps, clean vegetable scraps, grains, egg shells, coffee grounds, citrus peels

decomposers: composting worms

AIR

WATER

---

**What stays OUT:**

meat    dairy    oils

fish    processed foods    glass

plastics    metals    chemicals

spicy/salty/vinegary foods

papaya seeds    citrus fruit

The worms crawl out,  
The worms crawl in,  
They crawl all over the worm bin



They eat the goop,  
That makes them poop,  
The worms complete the nutrient loop,  
Ahooom, ahooom.



By: Bob the Worm Guy

Link for digital track download: [www.kokuahawaiifoundation.org/audio](http://www.kokuahawaiifoundation.org/audio)





# COMPOST LESSONS

Name .....

Lesson 3 \* Anaerobic Composting: Bokashi Prep

Class ..... Date .....

## KEY TERMS AND CONCEPTS

Anaerobic

Beneficial Microorganisms

Bokashi

EM

Fermentation

Microorganism

Mindful

Fill in the blanks.

1. The third type of composting we are going to do which means 'fermented organic matter' is called \_\_\_\_\_.

2. BENEFICIAL MICROORGANISMS can be used to \_\_\_\_\_ any and all types of food waste in an \_\_\_\_\_ environment meaning that air is absent.

3. To be aware and respectful of the millions of living microorganisms we will be handling is to be \_\_\_\_\_.

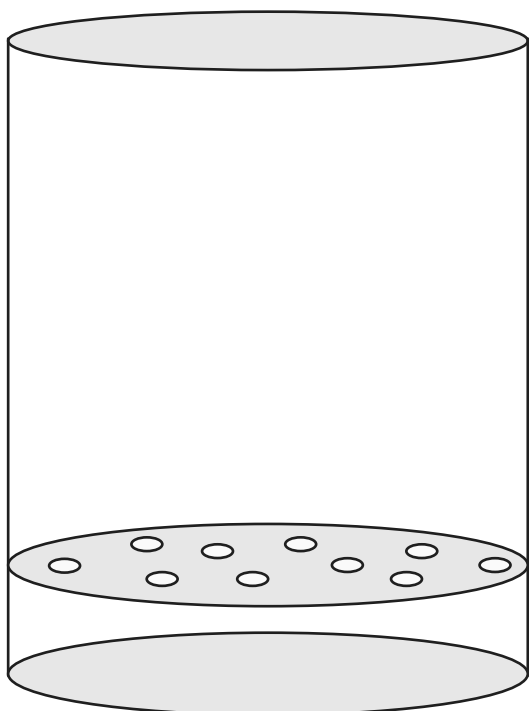
4. The three steps to BOKASHI composting using beneficial microorganisms are:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

5. Draw and label the main ingredients in the two bucket bokashi system:



What goes in the bokashi bucket:

bokashi: wheatmill run, molasses, water

beneficial microorganisms: EM or indigenous microorganisms

food waste: fruit and vegetable scraps, grains, meat, processed foods

leachate

What stays out of the bokashi bucket:

moldy or rotten foods

paper products

air



Notes, Drawings, and Observations

## COMPOST LESSONS

Name .....

Class ..... Date .....

**Directions: Use this space to record your notes, drawings, and observations.**



# COMPOST LESSONS

## KEY TERMS AND CONCEPTS

Bokashi

Beneficial Microorganisms

EM

Nutrient Cycle

Fill in the blanks.

1. What are the 3 kinds of compost systems we learned how to make and care for?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

2. In the last lesson we made BOKASHI. What were the 4 ingredients we mixed together?

1. \_\_\_\_\_

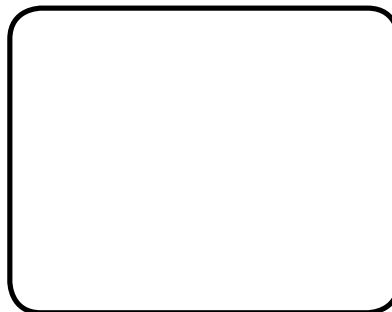
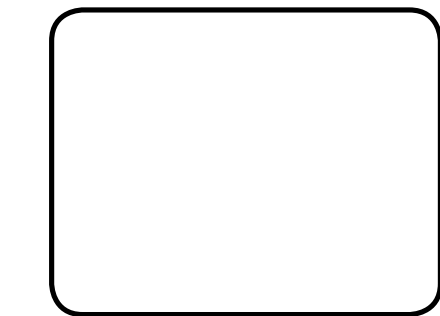
2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

3. Draw and label the NUTRIENT CYCLE, the movement and exchange of organic and inorganic matter back into the production of living matter.

a. \_\_\_\_\_



d. \_\_\_\_\_

c. \_\_\_\_\_

b. \_\_\_\_\_

**WORD BANK**

organic matter

plants

decomposers (F.B.I.)

soil & compost

**Directions:** Create your own Mad Lib by writing in a mindful word in each blank. Have fun!

\_\_\_\_\_ soil makes \_\_\_\_\_ plants,  
(adjective) (adjective)  
 \_\_\_\_\_ plants make \_\_\_\_\_ food,  
(adjective) (adjective)  
 \_\_\_\_\_ food makes \_\_\_\_\_ people,  
(adjective) (adjective)  
 \_\_\_\_\_ people have good attitudes.  
(adjective)



It's time to get back down,  
 Underground to the microorganism town,  
 We got \_\_\_\_\_ leaves and \_\_\_\_\_ from trees and bugs all around,  
(adjective) (noun)  
 A lot of decomposing going down.



We got the FBI, fungi, bacteria, and invertebrates,  
 They're breaking down organic matter back into the soil,  
 So the roots can have a taste.

Because \_\_\_\_\_ soil makes \_\_\_\_\_ plants,  
(adjective) (adjective)  
 \_\_\_\_\_ plants make \_\_\_\_\_ food,  
(adjective) (adjective)  
 \_\_\_\_\_ food makes \_\_\_\_\_ people,  
(adjective) (adjective)  
 \_\_\_\_\_ people have good attitudes  
(adjective)



Compost that's the way to get the most,  
 Nutrients back in the soil,  
 Compost that's the way to get the most,  
 Nutrients back in the soil,  
 Go compost.



By Jack Johnson  
 Link for digital track download: [www.kokuahawaiiifoundation.org/audio](http://www.kokuahawaiiifoundation.org/audio)



Student Worksheet  
**COMPOST LESSONS**

Name .....

Lesson 4 \* Anaerobic Composting: Bokashi Use Class ..... Date .....

# Composting Systems Comparison

**Directions:** Complete the questions below, comparing the three composting system types.

**L**  
**A**  
**W**

	Aerobic Compost Pile	Vermiculture (Worm Bin)	Bokashi
1. What types of organic matter are OK to be added in the compost system?			
2. What types of decomposers (F.B.I.) are found in the compost system?			
3. Does the compost system require air?			
4. Does the compost system require water?			
5. What types of waste stays out of the compost system?			
6. How long does it take to produce finished compost?			



Notes, Drawings, and Observations

## COMPOST LESSONS

Name .....

Class ..... Date .....

**Directions: Use this space to record your notes, drawings, and observations.**



# COMPOST LESSONS

## Lesson 5 \* Aerobic Composting: Harvest

Name .....

Class ..... Date .....

### KEY TERMS AND CONCEPTS

Aerobic

Bacteria

Compost

Fungi

Invertebrate

Organic matter

Fill in the blank.

1. \_\_\_\_\_ is decayed organic matter that is used to improve soil texture and fertility.

2. List two reasons why compost is important:

1. \_\_\_\_\_

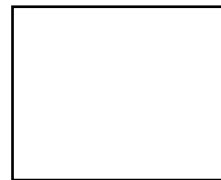
\_\_\_\_\_

2. \_\_\_\_\_

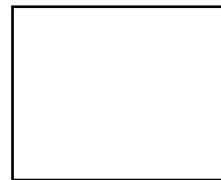
\_\_\_\_\_

3. What does L.A.W. stand for? Fill in the blanks and draw a picture in each box.

L \_\_\_\_\_



A \_\_\_\_\_



W \_\_\_\_\_



4. Draw and label the main ingredients in the aerobic compost pile:



What goes in:

LIFE/Organic Matter

carbon: sticks, branches, dried leaves, wood chips, shredded paper

nitrogen: green leaves, grass clippings, fruit waste, vegetable waste

decomposers: fungi, bacteria, invertebrates

AIR

WATER



Notes, Drawings, and Observations

# COMPOST LESSONS

Name .....

Class ..... Date .....

**Directions: Use this space to record your notes, drawings, and observations.**





# COMPOST LESSONS

## Lesson 6 \* Vermicomposting: Harvest

Name .....

Class ..... Date .....

### KEY TERMS AND CONCEPTS

Aerobic

Decomposers

Decomposition

Leachate

Mindful

Worm Tea/Vermicast Tea

Vermicast/Vermicompost

Vermicomposting/  
Vermiculture

Fill in the blank.

1. What are the key ingredients to a healthy vermiculture system?

**L** \_\_\_\_\_ /organic matter

Carbon: \_\_\_\_\_

Nitrogen: \_\_\_\_\_

Decomposers: \_\_\_\_\_

**A** \_\_\_\_\_

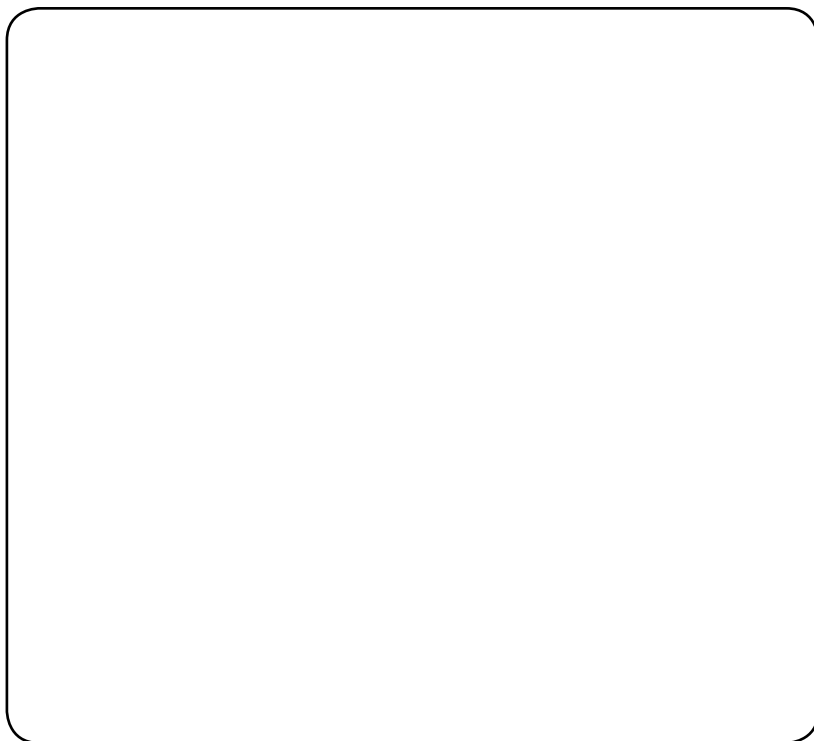
**W** \_\_\_\_\_

2. The process by which a material is broken down into simpler forms of matter is called \_\_\_\_\_.

3. \_\_\_\_\_ is also known as worm castings or worm poop. It is a living fertilizer full of nutrients for the soil.

4. The liquid that drains from a worm bin, is diluted with water, and used to enrich the soil around trees is called \_\_\_\_\_.

4. Draw and label the kinds of decomposers you observed in the vermiculture (worm bin):



- Decomposers:
- composting worm
  - ant
  - earthworm
  - grub
  - millipede
  - slug
  - snail
  - sow bug
  - cockroach



Notes, Drawings, and Observations

# COMPOST LESSONS

Name .....

Class ..... Date .....

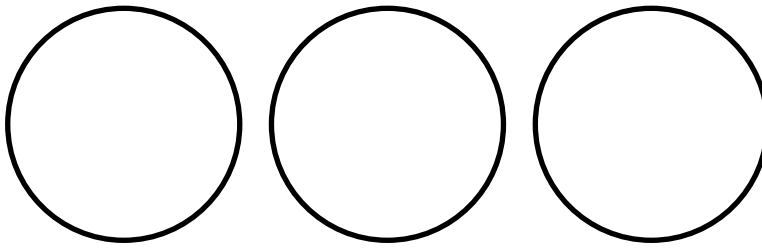
**Directions: Use this space to record your notes, drawings, and observations.**



## Compost Systems Review

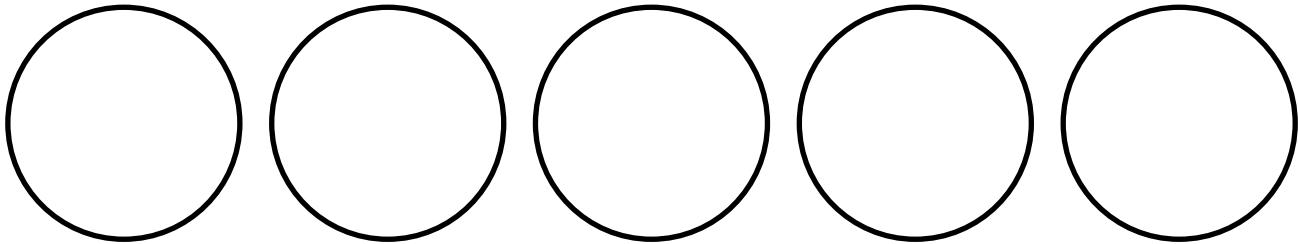
1. What is compost? \_\_\_\_\_  
\_\_\_\_\_

2. What does L.A.W. stand for? Draw a picture in each circle.



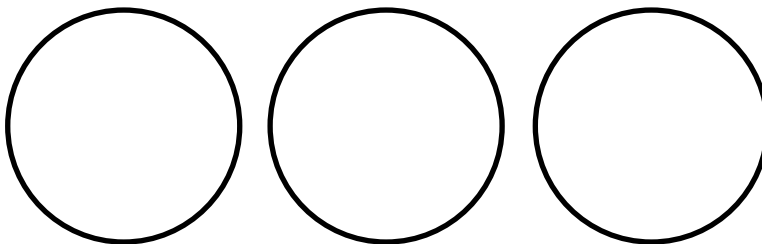
L \_\_\_\_\_ A \_\_\_\_\_ W \_\_\_\_\_

3. Life is organic matter. List some examples of organic matter and draw a picture in each circle. Color the nitrogen sources green and color the carbon sources brown.



\_\_\_\_\_

4. What does F.B.I. stand for? Draw a picture in each circle.



F \_\_\_\_\_ B \_\_\_\_\_ I \_\_\_\_\_



Student Worksheet  
**COMPOST LESSONS**

Lesson 7 & 8 \* Team Poster Project

Name .....

Class ..... Date .....

# Composting Systems Comparison

**Lesson 7 Directions:** Fill in the answers in each box during the Compost Systems Review.

**Lesson 8 Directions:** During the Team Poster Project presentations, add any additional information.

	Aerobic Compost Pile	Vermiculture (Worm Bin)	Bokashi
<b>L</b>	1. What types of organic matter are OK to be added in the compost system?		
	2. What types of decomposers (F.B.I.) are found in the compost system?		
<b>A</b>	3. Does the compost system require air?		
	4. Does the compost system require water?		
<b>W</b>	5. What types of waste stays out of the compost system?		
	6. How long does it take to produce finished compost?		



Student Worksheet  
**COMPOST LESSONS**

Lesson 7 & 8 \* Team Poster Project

Name .....

Class ..... Date .....

## Team Poster Project

**Part 1 Directions:** Circle your team's compost system:

Aerobic

Vermicomposting

Bokashi

**Part 2 Directions:** Your teacher will assign you a job from the list below. 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.

1. Name \_\_\_\_\_

**Job #1 Supplies** List then draw, color, and label all the supplies needed to build this compost system.

2. Name \_\_\_\_\_

**Job #2 Diagram** Draw, color, and label a diagram of this compost system in action.

3. Name \_\_\_\_\_

**Job #3 Ingredients** List then draw, color, and label the main ingredients needed for this compost system.

4. Name \_\_\_\_\_

**Job #4 Decomposers** List then draw, color and label the different types of decomposers found in this compost system.

5. Name \_\_\_\_\_

**Job #5 Waste In & Waste Out** List then draw, color and label the types of waste that can be put into and the types of waste that stays out of this compost system.

6. Name \_\_\_\_\_

**Job #6 Survey & Graph** Take a class survey of how many students in your class use this compost system at home. Tally your results and create a graph.

**Part 3 Directions:** Assemble your compost poster as a team and plan your presentation.



Student Worksheet  
**COMPOST LESSONS**  
Lesson 7 & 8 \* Team Poster Project

Name .....

Class ..... Date .....

## Job #1 - Supplies

**1a. List all of the supplies needed to build your compost system.**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**1b. Draw, color, and label these supplies individually on your half sheet of paper so that you can share in your presentation.**

## Job #2 - Diagram

**2. Draw, color, and label this compost system in action on your half sheet of paper so that you can share in your presentation.**



Student Worksheet  
**COMPOST LESSONS**  
Lesson 7 & 8 \* Team Poster Project

Name .....

Class ..... Date .....

### Job #3 - Ingredients

**3a. List all of the main ingredients needed for your compost system.**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**3b. Does your compost system require air?**

**3c. Does your compost system require water?**

**3d. Draw, color, and label these ingredients individually on your half sheet of paper so that you can share in your presentation.**

### Job #4 - Decomposers

**4a. List all of the different types of decomposers found in your compost system.**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**4b. Draw, color, and label these decomposers on your half sheet of paper so that you can share in your presentation.**



Student Worksheet  
**COMPOST LESSONS**  
Lesson 7 & 8 \* Team Poster Project

Name .....

Class ..... Date .....

## Job #5 - Waste In & Waste Out

5a. List the types of waste that can be put into this compost system.

.....  
.....  
.....

5b. List the types of waste that stays out of this compost system.

.....  
.....  
.....

5c. Draw, color, and label these types of waste individually on your half sheet of paper so that you can share in your presentation.

## Job #6 - Survey & Graph

6a. Take a class survey and tally your results.

6b. How many students use this compost system at home?

Yes ..... No .....

6c. On your half sheet of paper create a graph to represent this data so that you can share in your presentation.





# REFLECTION

**Directions:** Fill in your answers to the questions below.

1. What do you remember most about your composting experience this school year? \_\_\_\_\_

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2. Briefly describe the aerobic composting method: \_\_\_\_\_

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3. Briefly describe the vermicomposting method: \_\_\_\_\_

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4. Briefly describe the bokashi composting method: \_\_\_\_\_

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---

5. What is your favorite composting method and why? \_\_\_\_\_

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Student Worksheet  
**COMPOST LESSONS**  
Lesson 8 \* Team Poster Project

Name .....

Class ..... Date .....

6. Why is composting important? \_\_\_\_\_

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7. Why are microorganisms important? \_\_\_\_\_

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8. Draw and label a picture of your vision for a waste-free world!



Notes, Drawings, and Observations

# COMPOST LESSONS

Name .....

Class ..... Date .....

**Directions: Use this space to record your notes, drawings, and observations.**



Notes, Drawings, and Observations

# COMPOST LESSONS

Name .....

Class ..... Date .....

**Directions: Use this space to record your notes, drawings, and observations.**

I have been at this school since grade: K 1 2 3 (circle one)

1. **Composting is breaking down organic material into smaller parts.**

Circle: True or False

2. **Circle which items can be put into an aerobic compost pile. Circle all that apply:**



Bread



Soil



Dried Leaves



Banana peels



Cheese



Orange peels



Plastic bottles



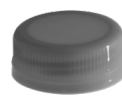
Cardboard



Aluminum cans



Sticks



Bottle caps



Water



Chicken bones



Green Leaves

3. **Circle which items can be fed to composting worms. Circle all that apply:**



Bread



Soil



Dried Leaves



Banana peels



Cheese



Orange peels



Plastic bottles



Cardboard



Aluminum cans



Bottle caps



Water



Chicken bones



Shredded Paper

4. **What decomposers break down organic matter? Circle ONE answer:**

- a. Fungi, Bacteria, Invertebrates
- b. Water, Nitrogen, Carbon
- c. Wheat Mill Run, Molasses, Beneficial Microorganisms

5. **Circle ONE answer. After organic matter is composted, nutrients are returned to the:**

- a. Air
- b. Water
- c. Soil

6. **Which composting method is best for composting leftover meat & bones? Circle ONE answer:**

- a. Aerobic compost pile
- b. Vermiculture (worms)
- c. Bokashi

7. Do you like gardening? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

8. Do you like eating fruits and vegetables? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

9. Do you like cooking? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

10. Do you like making compost? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

11. Do you like 'ĀINA Lessons? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

12. Do you and your family grow any food at home? Circle: Yes or No

If yes, please list the foods you grow at home: \_\_\_\_\_

13. Do you compost at home? (compost pile, worm bins, or bokashi bucket) Circle: Yes or No

14. How often do you eat fruits and vegetables? Circle ONE answer:

- a. I don't eat fruits and vegetables      b. 1-2 times a week      c. 3-5 times a week      d. Every day

15. Circle the fruits and vegetables that you like to eat:

Apple    Cantaloupe    Banana/Mai'a    Blueberries    Avocado    Coconut/Niu    Guava    Dragonfruit  
Mango    Passionfruit/Liliko'i    Honeydew    Rambutan    Tangerine    Strawberry    Blackberries  
Lemon    Starfruit    Breadfruit/'Ulu    Lychee    Orange    Papaya    Pineapple    Watermelon  
Radish    Spinach    Basil    Beans    Broccoli    Squash    Zucchini    Sweet Potato/'Uala    Corn    Tomato  
Lettuce    Watercress    Taro/Kalo    Cucumber    Green Beans    Asparagus    Carrots    Celery    Kale

Other: \_\_\_\_\_

16. Describe what 'āina means to you: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

17. List two ways that you take care of the 'āina:

1. \_\_\_\_\_  
2. \_\_\_\_\_

18. Complete the following sentence:

My favorite thing about 'ĀINA In Schools Lessons is \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

INSIDE  
COVER  
BLANK

OUTSIDE-  
COVER  
BLANK