Environmental Lesson Plan

5E Learning Sequence: Grade Band K-2

Developed by K-12 Science Education Specialists in L.A. County and Aligned With:
California Common Core Standards,
Next Generation Science Standards (NGSS), and
California Environmental Principles and Concepts (CA EP&C)

Objective

Students will be able to identify and differentiate between organic waste and other waste products, its production, and impact on the environment. Students will propose actions they can take to reduce organic.

Standards

Next Generation Science Standards (NGSS)

- K-ESS3-3- Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- 2-PS1-1 - Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- K-2-ETS1-1 - Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

California Environmental Principles and Concepts

- **Principle II -** People Influence Natural Systems
  Concept A. Direct and indirect changes to natural systems due to the growth of human populations and their consumption rates influence the geographic extent, composition, biological diversity, and viability of natural systems.
- **Principle IV** - There are no Permanent or Impermeable Boundaries that Prevent Matter from Flowing Between Systems
  Concept B. The byproducts of human activity are not readily prevented from entering natural systems and may be beneficial, neutral, or detrimental in their effect.
  Concept C. The capacity of natural systems to adjust to human-caused alterations depends on the nature of the system as well as the scope, scale, and duration of the activity and the nature of its byproducts.

Common Core State Standards - Language Arts

Reading: Literature

- CCSS.ELA-LITERACY.RL.K.1 - With prompting and support, ask and answer questions about key details in a text.
- CCSS.ELA-LITERACY.RL.K.2 - With prompting and support, retell familiar stories, including key details.
- CCSS.ELA-LITERACY.RL.K.3 - With prompting and support, identify characters, settings, and major events in a story.
- CCSS.ELA-LITERACY.RL.1.1 - Ask and answer questions about key details in a text.
- CCSS.ELA-LITERACY.RL.1.2 - Retell stories, including key details, and demonstrate understanding of their central message or lesson.
- CCSS.ELA-LITERACY.RL.2.1 - Ask and answer such questions as *who, what, where, when, why,* and *how* to demonstrate understanding of key details in a text.

Reading: Informational Text

Key Ideas and Details:

- CCSS.ELA-LITERACY.RI.K.1 With prompting and support, ask and answer questions about key details in a text.
- CCSS.ELA-LITERACY.RI.K.2 With prompting and support, identify the main topic and retell key details of a text.
- CCSS.ELA-LITERACY.RI.K.3 With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.
- CCSS.ELA-LITERACY.RI.1.1 Ask and answer questions about key details in a text.
- CCSS.ELA-LITERACY.RI.1.2 Identify the main topic and retell key details of a text.
- CCSS.ELA-LITERACY.RI.1.3 Describe the connection between two individuals, events, ideas, or pieces of information in a text.
- CCSS.ELA-LITERACY.RI.2.1 Ask and answer such questions as *who, what, where, when, why,* and *how* to demonstrate understanding of key details in a text.
- CCSS.ELA-LITERACY.RI.2.2 Identify the main topic of a multi-paragraph text as well as the focus of specific paragraphs within the text.

Speaking and Listening

Comprehension and Collaboration:

- CCSS.ELA-LITERACY.SL.K.1 Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.K.1.A Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).
- CCSS.ELA-LITERACY.SL.K.1.B Continue a conversation through multiple exchanges.
- CCSS.ELA-LITERACY.SL.1.1 Participate in collaborative conversations with diverse partners about *grade 1 topics and texts* with peers and adults in small and larger groups.
- CCSS.ELA-LITERACY.SL.2.1 Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.

Writing

Text Types and Purposes:

- CCSS.ELA-LITERACY.W.1.1 Write opinion pieces in which they introduce the topic or name the book they are writing about, state an opinion, supply a reason for the opinion, and provide some sense of closure.
- CCSS.ELA-LITERACY.W.1.5 With guidance and support from adults, focus on a topic, respond to questions and suggestions from peers, and add details to strengthen writing as needed.

Time Needed

4-5 hours collectively, as it can be broken down into three smaller sections or as needed:

1. Introduction: Engage, Explore 1, (Student) Explain
2. Procedure: Teacher Explain, Explore 2, (Student) Explain 2
3. Conclusion: Elaborate and Extend

Materials Needed

- School- or parent-provided lunch. Supplement with additional materials such as fruits or vegetables from snack time.
- Sorting cards and template - Attachment
- Aprons or old t-shirts
- Scissors
- Glue sticks
- Non-latex gloves
- Safety goggles
- Sorting bins (boxes or any type of container) labeled: “Organic Waste”, “Non-organic Waste”
- Lab book or writing booklet
- Writing instruments
- Literacy Books

Literacy Books

- For Kindergarten:

  Compost Stew: An A to Z Recipe for the Earth (Dragonfly Books) Paperback by Mary McKenna Siddals (Author), Ashley Wolff (Illustrator)

  Read Aloud YouTube video link →Story time: Compost Stew

- For 1st and 2nd:

  Save the Scraps (Bethany Stahl Copyright) Paperback by Bethany Stah (Author and Illustrator)

Read Aloud YouTube video link → Save the Scraps by Bethany Stahl | Children's Animated Audiobook | A Story About Composting

Teacher Background

40% of food produced is lost or wasted (USDA, 2010). Most of this wasted food ends up in landfills. Although food loss or spoilage can happen at any stage, from damage during production, loss due to animals and bacteria or molds, retail equipment failure, consumers are responsible for a high percentage of loss by buying and cooking more than they can eat and throwing away what is left (Buzby et al 2014).

Organic waste is any material that is biodegradable and comes from either a plant or an animal. Biodegradable waste is organic material that can be broken into carbon dioxide, methane, or simple organic molecules. Examples of organic waste include green waste, food waste, food-soiled paper, non-hazardous wood waste, green waste, and landscape and pruning waste. When organic waste is dumped in landfills, it undergoes anaerobic decomposition (due to the lack of oxygen) and produces methane. When released into the atmosphere, methane is 20 times more potent a greenhouse gas than carbon dioxide. Organics recycling reduces greenhouse emission while conserving our natural resources.

With climate change accelerating so rapidly, California along with other states, spearheaded a series of laws and mandates to help alleviate and decrease methane production from organic waste dumping in landfills. CA State Law AB 1826 mandated that all multi-family properties and businesses decrease their organic waste production through recycling. Appendix 1

Beginning January 2022, the most aggressive waste reduction law was enacted, Senate Bill 1383. This bill is far more reaching and encompasses single-family homes, public and charter schools, and large commercial corporations, among others. It even goes as far as allowing jurisdictions to impose penalties for non-compliance. Appendix 2

As educators, we can do our part by teaching our young students to know what organic waste is and to encourage them to decrease their own production, their home's , and extend their awareness and action to their classroom and their school. Small steps have a great impact.

Academic/Scientific Vocabulary

(S12a) **Organic Waste** - Any material that derives from either a plant or animal and is biodegradable.
(S12b) **Biodegradable** - Organic materials that can break down or decompose into smaller organic molecules and gasses such as carbon dioxide and methane.
(S12c) **Recycling** - to pass again through a series of changes or treatments. To process (something, such as liquid body waste, glass, or cans) in order to regain material for human use. (https://www.merriam-webster.com/dictionary)
(S12d) **Landfill** - a system of trash and garbage disposal in which the waste is buried between layers of earth to build up low-lying land. (https://www.merriam-webster.com/dictionary)
(S12e) **Compost** - a mixture that consists largely of decayed organic matter/waste and may be used for fertilizing and conditioning land

Before the Lesson
To prepare for the lesson, when you plan on doing the Extend activity , plan ahead and inform parents about your lesson and ask them to help you by sending a snack or packing a lunch for their child that includes their regular favorite foods. If students are participating in a school lunch program, check with your cafeteria and choose a day when there is a variety of food options that include organic and inorganic waste. For the kindergarten students, ask an aide or campus supervisor to collect their trash in a box (or if you are able to do this, it would be even better). For 1st and 2nd graders, ask them to put their trash in predesignated cardboard boxes you can make available to them. Have these boxes ready to use along with containers labeled Organic Waste and Non-Organic or Inorganic Waste.

(S1) **Lesson Title - Organic Waste and Recycling**

Introduction (Engage) - Essential Question: What happens with all the leftover food after people eat?

1) (S2) After snack or lunch, ask students and chart their answers: What did you have for snack/lunch today?
2) Ask:
    a) Did you have any leftovers?
    b) What did you do with them?
        i) Possible answers:

(1) They threw them in the trash, they saved them to eat later, or they are taking them home to their family.

3) (S3) Ask:
    a) What do you think happens to the leftovers you threw in the trash?
        i) Possible answers:
            (1) The garbage truck picks them up.
            (2) They go to the dump.

4) Ask:
    a) Once they are in the dump, trash, etc., what do you think will happen to them?
        i) Possible answers:
            (1) K: They just go away? Disappear? Many will not have answers
            (2) 1st and 2nd: They will go bad, rot, decompose.

5) (S4) Show the students a picture of organic waste in landfill, ask them to make observations about what they notice.

Puente Hills Material Recovery Facility - Los Angeles Daily News

6) Explain to students that this is a picture of a landfill in California.

7) Ask:
    a) What kind of trash or waste do you see
    b) What do you think we can do to make sure we don't throw away so much food? Note: This is a rhetorical question at this moment. Let students think about it but do not have them answer yet. This will be revisited later on in the lesson.

8) Explain that Food waste is one kind of organic waste and is different from other types of waste. It can be recycled but must be separated from others. In the next activity, they will learn what material is considered Organic Waste.

(S5) **Introduction** (Explore) - Essential Questions: What is organic waste? How can we identify it from other types of waste?

(S6) Organic and Inorganic/Non-Organic Waste Card Sort

1) Hand each student a copy of the Organic Waste sort cards and Sorting Table (Appendix 3), scissors and glue.

2) (S7) Tell the students that they must cut out the cards and sort them into those materials they think are organic and inorganic. Note: Kinder students may need to have the pictures already cut out for them to save time.

3) (S8)Ask:
    a) What rule or criteria are you using to separate your items?
        i) Possible answers:
            (1) These are fruits and vegetables.
            (2) We eat these things, and these we can't.
    b) How do you know these belong in this column?
        i) Possible answers:
            (1) They are the same in that we can eat them.

4) Students should start making connections with the picture from the Engage section (have this on the screen if needed). Try not to give them the answer and if they are struggling with any of them, just let them guess or place them in the middle of the two columns. They may be unsure about the paper plates and coffee filter and grounds, but these items are plant derived. Note: Kinder students may struggle with this concept since they may not understand the difference between living and non-living things. Help them by asking them if it would be something they would eat or what they would eat on. It is fine if they place the items in the wrong column. They will have a chance to revise their answers later.

Introduction (Student Explain) - Essential Questions: What is organic waste? How can we identify it from other types of waste?

Lab Book Writing

1) (S9) When students are finished with the sorting activity, ask them to write down on their journals answers to the following questions or prompts:
    What do the organic waste items have in common?
    What do the non-organic waste items have in common?

What is your definition of Organic Waste?
Why is organic waste different from other types of the other waste materials?

2) Students should start to notice that organic waste are materials that are derived from living/biotic organisms. Most of the items are food items since as consumers, we primarily eat biotic materials derived from producers like plants and animals.

3) Have students share their answers with a partner, table group, or whole group. Do not confirm if answers are correct yet.

Procedure (Teacher Explain)

1) (S10 & S11) Read to the students either Save *the Scraps* by Bethany Stahl or play the YouTube read-aloud Save the Scraps by Bethany Stahl | Children's Animated Audiobook | A Story About Composting or *Compost Stew: An A to Z Recipe for the Earth* by Mary McKenna Siddals, YouTube read-aloud Story time: Compost Stew, stopping along the way to check for understanding, make predictions, and compare to the activity they did in the Explore section.

2) For Kinder, just bringing awareness of the excessive amount of food being wasted would be enough and that this food waste can be decreased by not taking more than they are able to eat.

3) (S12) For grades 1 and 2, share the Kids Go Green: Reducing Food Waste video that discusses what is organic waste, the need for waste reduction, and offers easy steps they can follow to do their part.

4) Discuss with them as you watch words like organic waste, pollution, recycling. Reiterate from the video that as food decomposes, it creates a gas called methane that heats up our atmosphere and is one of the main reasons why our temperatures are increasing. This rise in temperature is making the planet warmer and harming our ecosystems and all living things.

5) Allow students to revise their sort activity answers or review together the answers from the presentation. Use the document camera to show them the answers. Let them guide you through the process of where each item belongs and if there are any disagreements over an item, prompt them by discussing the origin of the item. Organic waste is any material that derives from either a plant or animal. It is

biodegradable, which means it can decompose into smaller organic molecules and gasses like carbon dioxide and methane.

Conclusion (Elaborate and Extend) - Essential Question: What can we do to reduce our organic waste production, individually and as a school community?
(Elaborate)
Note: This is when you should collect the lunch/snack leftover boxes from the cafeteria. See information above in the **Before the Lesson** section. This activity should be conducted ideally in an outdoor setting where it can be easily cleaned.

For Kindergarten:
This section is a Teacher Demonstration activity with the students guiding the teacher as to where to place each item. You may want to limit the items sorted based on time availability and student understanding of organic waste concept.

(S13) Teacher Demonstration:

1) Collect the box filled with the students' lunch waste from the cafeteria and set it on a table where students can see it.
2) Have the pre-labeled bins Organic Waste and Inorganic/Non-Organic Waste set up in front of the classroom on a table where students can see them.
3) Put on the latex-free rubber gloves and an apron to protect clothing.
4) Pick up one item at a time from the waste box and ask students in which bin each item belongs. Go through as many of the items as needed to show if students understand what is organic waste.

For 1st and 2nd:
Using teacher discretion, this activity can be done as a Teacher Demonstration OR if the teacher feels that the students are able to handle it in small groups. Ask parent or school volunteers to help monitor the small groups. Follow similar steps as the Teacher Demonstration making these modifications.
For each group,

- ➢ Separate the students' lunch waste from the cafeteria into boxes for each group.
- ➢ Have enough bins labeled Organic Waste and Inorganic/Non-Organic Waste
- ➢ Make sure they all wear non-latex rubber gloves and aprons or old t-shirts to protect their clothing.
- ➢ Have students taking turns handling the items and helping each other choose the correct bin to sort them into.

(S14) (Extend) - Essential Question: What can they do to decrease waste at home, classroom, school?

1) Say: Now that you have an understanding of what organic waste is and how much you produce, what are some things you can do to help reduce this amount…
    a) At home?
    b) In our classroom?
    c) In our school?

Appendix 1 - Organic Waste Requirements Flyer

Visit the following website for more information:

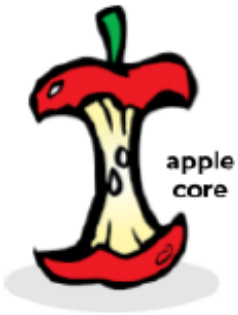
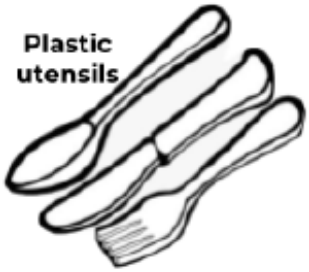
SB 1381 Education and Outreach Resources

SB 1383 Talking Points PPT

Appendix 2

ORGANIC and INORGANIC/NON-ORGANIC WASTE SORT CARDS

Directions: Cut and classify/sort the following items into Organic Waste and Inorganic Waste. Paste them on the table.

 carrot	 Glass containers	 apple core
 Plastic utensils	 lettuce	 Metal cans
 Cooking oil	 Used coffee filters and ground coffee	 Used paper goods (plates,napkins, etc.)
 Aluminum foil	 Eggs and eggshells	 Rice

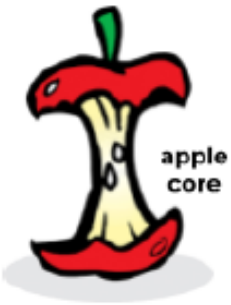
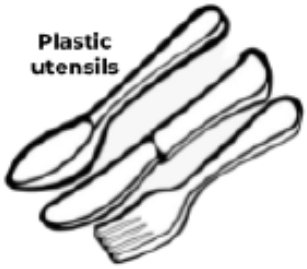
Name _____

ORGANIC and INORGANIC/NON-ORGANIC WASTE SORT CARDS

Organic Waste	Inorganic/Non-organic Waste

Answer Key

ORGANIC WASTE SORT CARDS

Organic Waste	Inorganic/Non-organic Waste
 carrot  apple core  lettuce  rice  Used coffee filters and ground coffee  Used paper goods (plates,napkins, etc.)  Eggs and eggshells	 Glass containers  Plastic utensils  Metal cans  Cooking oil  Aluminum foil