



Environmental Defenders Program  
*EnvironmentalDefendersLA.com*

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# Environmental Lesson Plan

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## 5E Learning Sequence: Grade Band 3-5

*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)*

## Reducing Organic Waste in Our Landfills

5E Learning Sequence

**Grade Band:** 3<sup>rd</sup>-5<sup>th</sup>

# Objective

Students will gain a shared understanding of what organic waste is, different types of organic waste and why it's important to reduce its presence in landfills. Students will be able to identify the various types of organic waste and explain how to dispose of them properly. They will apply their understanding by developing an action plan poster to help their families and school community reduce organic waste in the landfills to help our environment.

# Standards

## Next Generation Science Standards (NGSS)

[5-ESS3-1](#) Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

[5-PS1-3](#) Make observations and measurements to identify materials based on their properties.

[3-5-ETS1-2](#) Generate and compare multiple solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

## [California Environmental Principles and Concepts \(CA EP&C\)](#)

### 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 Informational Text

Key Ideas and Details:

[CCSS.ELA-LITERACY.RI.5.1](#)

Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Integration of Knowledge and Ideas:

CCSS.ELA-LITERACY.RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

CCSS.ELA-LITERACY.RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

## **Writing**

Text Types and Purposes:

CCSS.ELA-LITERACY.W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

Research to Build and Present Knowledge:

CCSS.ELA-LITERACY.W.5.9 Draw evidence from literary or informational text to support analysis, reflection, and research.

## **Speaking and Listening**

Comprehension and Collaboration:

CCSS.ELA-LITERACY.SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-lead) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.5.2 Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

Presentation of Knowledge and Ideas:

CCSS.ELA-LITERACY.SL.5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

**Time Needed:** 3 - 4 hours collectively, as it can be broken down into three smaller sections or as needed:

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

## **Materials Needed:**

- Projector or monitor for Organic Waste PPT
- Internet connection
- Classroom Board or Chart Paper
- Student Guide Sheet (one per student)
- Poster Paper or Tagboard
- Markers / Writing Materials

- 1 trashcan full of lunch time waste
- Non-latex gloves
- Safety goggles
- Weight scale

### Resources: Informational Text and Video's

- (For S15) Appendix A - SB 1383 Climate Pollutant Reduction Law
- (For S15) Appendix B – Recycling and Organics: Recycling Guide for Schools
- San Diego Plans to Divert Organic Waste from Landfills to Meet Climate Goals= <https://www.youtube.com/watch?v=mlPIKEkDR3M>
- New 2022 Organic Waste Law Aims to Reduce Landfills by 75 Percent= <https://www.youtube.com/watch?v=Ctqrmutzt6g>

### Teacher Background and Definitions

Senate Bill 1383, which went into effect on January 1, 2022 requires that jurisdictions conduct educational outreach on organic recycling to all residents and businesses. This Senate Bill aims to decrease organic waste from landfills by 75% from 2014 rates by the year 2025 ([SB 1383 Implementation](#)). 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. Methane has more than 80 times the warming power of carbon dioxide over the first 20 years after it reaches the atmosphere. Even though CO<sub>2</sub> has a longer-lasting effect, methane sets the pace for warming in the near term ([edf.org](#)). Organics recycling reduces greenhouse emission while conserving our natural resources. Examples of organic waste include green waste, food waste, food-soiled paper, non-hazardous wood waste, green waste, and landscape and pruning waste (Appendix C). As educators we can empower students to take action to reduce organic waste in landfills in order to help our environment as well as to ensure we all comply with Senate Bill 1383.

**Physical Property:** Any property used to characterize matter and energy and their interactions ([Vocabulary.com](#)). Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property ([NGSS 5-PS1-3](#)).

**Organic Waste:** Any material that is biodegradable and comes from either a plant or an animal. Examples include green waste, food scrapes and food-soiled paper.

**Biodegradable Waste:** Organic material that can be broken into carbon dioxide, methane or simple organic molecules.

**Methane Gas:** Methane is the second most abundant greenhouse gas, after carbon dioxide. Though it breaks down more quickly, methane traps 80 times more heat than carbon dioxide, making it a major contributor to climate change. In fact, according to the UN Environment Programme, methane has accounted for roughly 30% of climate change since pre-industrial times. Quickly and dramatically reducing methane pollution is an essential step to preventing the worst climate impacts ([lung.org](#)).

### (S1) Lesson Title – Reducing Organic Waste in Our Landfills

- Explain to students that in this lesson they will learn what organic waste is and the different types of organic waste that can be collected. They will also learn about the harmful effects

that organic waste has in our landfills. They will also develop an action steps poster they can utilize to help others understand more about organic waste collecting and Senate Bill 1383.

**Essential Questions:** How does reducing organic waste in our landfills help our environment? What are some things you can do to help reduce organic waste in our landfills?

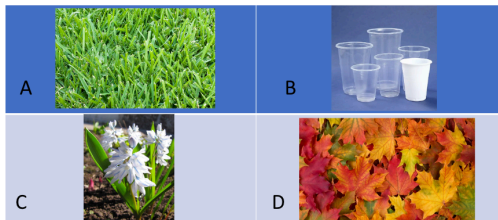
1. (S2) Show students the slide with the Essential Questions that will be addressed in this lesson. Ask students to volunteer and read the questions aloud to the class.
  - Have students discuss the Essential Questions with a partner. Ask students to then share with the class and have them write down their responses on the student guide. Ask students which types of items they recycle at their home or school. Record their responses on the board or chart paper to revisit during (S7).

## Introduction

### (Engage / Explore)

2. (S3) Let's Explore the Different Types of Organic Waste
  - (S4) Ask Students: Which one of these pictures is not like the others? Explain Why. How are the others alike? Allow students to discuss with a partner. Have them record their thoughts on their student guide before sharing with the class.

Which one of these pictures is not like the others? Explain Why. How are the others alike?



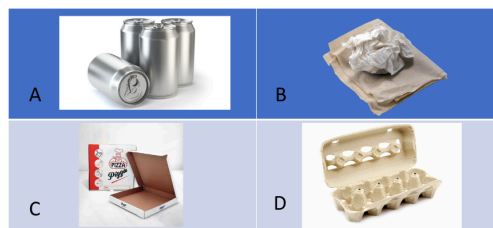
- Letter B is a picture that is not like the others. That is a picture of different types of cups that are made out of plastic. The other pictures of grass, flowers and leaves are alike because they all come from nature and we can find them in our yards outside.
- Record student responses on the board or chart paper, leave room at the top of the list for a title. Have students explore additional connections or physical properties between pictures A, C and D as compared to picture B.
- (S5) Ask Students: Which one of these pictures is not like the others? Explain Why. How are the others alike? Allow students to discuss with a partner. Have them record their thoughts on their student guide before sharing with the class.

Which one of these pictures is not like the others? Explain Why. How are the others alike?



- Letter C is a picture that is not like the others. That is a picture of gloves which is different than the pictures of turkey meat and bones, left-over food on a plate and of the banana peel and food scraps are alike because they all come from food we have prepared or eaten.
- Record student responses on the board or chart paper, leave room at the top of the list for a title. Have students explore additional connections or physical properties between pictures A, B and D as compared to picture C.
- (S6) Ask Students: Which one of these pictures is not like the others? Explain Why. How are the others alike? Allow students to discuss with a partner. Have them record their thoughts on their student guide before sharing with the class.

Which one of these pictures is not like the others? Explain Why. How are the others alike?



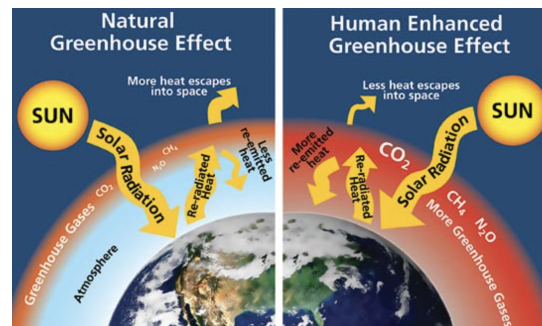
- Letter A is a picture that is not like the others. That is a picture of aluminum cans which is different than the pictures of things made out of paper. The other pictures of a pizza box, egg carton, napkins and tissues are made out of paper or trees.
- Record student responses on the board or chart paper, leave room at the top of the list for a title. Have students explore additional connections or physical properties between pictures B, C and D as compared to picture A.

## Procedure

### (Student Explain / Teacher Explain)

- (S7) Explain to students that there are three general categories of organic waste. Food Scraps, Food Soiled Paper and Green Waste. Go back to the recorded student responses for slides 4-6. Ask students which slides/list of student responses should be categorized with the following titles: Food Scraps, Food Soiled Paper and Green Waste. Slide 4 A, C and D are all examples of Green Waste, write "Green Waste" at the top of that list. Slide 5 A, B and D are all examples of Food Scraps, write "Food Scraps" at the top of that list; Slide 6 B, C and D are all examples of Food Soiled Paper, write "Food Soiled Paper" on the top of that list. Go back to the answers collected earlier during (S2). Ask students: *At the beginning of the lesson you listed things you recycle at home or school. Were any of them organic waste?* Have students discuss with an elbow partner and then take a quick survey of the class to see how many students already collect organic waste.

4. (S8) Tell students: The items listed on this slide are also types of organic waste. Which category of organic waste should each item be added to? Why? Have students add organic waste items discussed so far to their student guide. Discuss each item on the PowerPoint list as a class. Have students add the items to the appropriate organic waste category on their student guide. Make sure students can explain why those items belong in each category.
5. (S9) Academic / Scientific Vocabulary
  - Review the definitions of organic waste and biodegradable waste with the class. Be sure to emphasize that organic waste is biodegradable and that is why it produces gases including methane gas, which is harmful to our environment.
6. (S10) Display the picture of landfill. Have students answer the question in their student guide. Discuss as a class. Ask them if they've ever visited a landfill or if they know of one near where they live.
7. (S11) Teacher Explain: What happens to Organic Waste in our landfills? When carbon compounds break down from organic materials and bond with other compounds through anaerobic decomposition a harmful gas called methane is formed. Large amounts of methane are produced from the decomposition of organic materials in landfills. Have students fill in the blank on their student guide.
8. (S12) Teacher Explain: Why is methane gas harmful to our environment? Large amounts of methane are produced from the decomposition of organic materials in landfills. They are 20 times more potent as greenhouse gas than carbon dioxide Methane gas in Earth's atmosphere contributes to the Greenhouse Effect and Global Warming which has harmful effects on our environment. Organics recycling reduces greenhouse emissions. Have students describe what methane gas does to our environment in their student guide.



<https://climatechange.lta.org/get-started/learn/co2-methane-greenhouse-effect/>

*"Greater concentrations of greenhouse gases mean more solar radiation is trapped within the Earth's atmosphere, making temperatures rise. Source: [W. Elder, NPS.](#)"*

9. (S13) Teacher Explain: How do we properly dispose of organic waste so it does not end up in our landfills and cause methane gas? Show the video: Recycling Organic Waste at Home. Have students take notes in a journal. Pause the video as necessary to check for understanding. Discuss as a class and have students answer the question in their student guide.

## Conclusion



**(Elaborate / Extend)**

10. (S14) Show the video: Food and yard waste is the fastest way to fight climate change right now. Have students take notes in their journal. Pause the video as necessary to check for understanding. Students will learn how Senate Bill 1383 effects households and businesses and the purpose behind it. The Bill aims to reduce organic waste in California by 75% by the year 2025. It will also decrease pollution and greenhouse gases the equivalent of taking nearly two million cars off the road for a year. It will also create about 17,000 green jobs in the future.
11. (S15) Student Elaborate: Provide students with [Appendix A: SB 1383 Climate Pollutant Reduction Law](#) information sheet and [Appendix B: Recycling and Organics: Recycling Guide for Schools](#) information sheet as resources. Students will come up with an action plan poster to educate their household or school about Senate Bill 1383 and collecting organic waste. Provide students poster paper/tagboard and markers/writing materials to make an action plan poster. Consider having students hang their posters throughout the school campus including where students eat. Students will use “W” and “How” questions as a guide for their action plan poster.
12. (S16) Student Extend: How much organic waste can our school collect in one school year? Let your plant manager/custodian know that you will need one trashcan full of lunchtime waste. Ask them how many lunchtime trashcans are dumped on average in one day. Have students wear non-latex gloves and goggles before separating the inorganic and organic waste. It’s advisable to do this activity outside of the classroom on a bench covered by butcher paper or on the ground. In their journals have students list all the inorganic and organic waste collected. Weigh the organic waste material. You can do this by collecting it in a bag and weighing it, or by weighing the empty trash can and then weighing it again with the organic waste. Subtract the weight of the empty trash can from the weight of the trash can and organic waste. Get a school calendar and calculate how many days students are attending classes. Have students multiply the weight of organic waste collected from the trashcan by how many trashcans get dumped on average per day after lunchtime by the number of days they are in school. This will total the approximate weight of organic waste the school collects in one school year. Use this online food scrap calculator to determine the equivalent emissions that were decreased by not sending the organic waste to the landfill: [Natur-Bag Food Scrap Calculator](#)

Name \_\_\_\_\_

Date \_\_\_\_\_



**Reducing Organic Waste in Our Landfills**  
**Student Guide**

**(S2) Essential Questions for this Lesson:**

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**(S3) Let's Explore Different Types of Organic Waste**

Directions: Identify which picture is not like the others. Explain Why. How are the others alike?

**(S4) 1<sup>st</sup> group of pictures:**

Letter \_\_\_ is not like the others because \_\_\_\_\_

\_\_\_\_\_ Letters \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ are alike because \_\_\_\_\_

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**(S5) 2<sup>nd</sup> group of pictures:**

Letter \_\_\_ is not like the others because \_\_\_\_\_

Letters \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ are alike because \_\_\_\_\_

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**(S6) 3<sup>rd</sup> group of pictures:**

Letter \_\_\_ is not like the others because \_\_\_\_\_

\_\_\_\_\_ Letters \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ are alike because \_\_\_\_\_

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**(S7) The Three General Categories of Organic Waste are:**

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

**(S8) Directions: Under each title list items discussed so far. Add additional items that are on the list.**

*Types of Organic Waste*

<b><i>Food Scraps</i></b>	<b><i>Green Waste</i></b>	<b><i>Food Soiled Paper</i></b>
Examples include: - - - - - - - - -	Examples include: - - - - - - - - -	Examples include: - - - - - - - - -

**(S9) All Organic Waste is Biodegradable**

Organic Waste is \_\_\_\_\_

Biodegradable waste is organic material that

**(S10) How would you describe a landfill? How does all that trash get there?**

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**(S11) Fill in the blank:**

In Landfills organic waste undergoes \_\_\_\_\_ which produces\_\_\_\_\_.

**(S12) Describe what methane gas does to our environment:**

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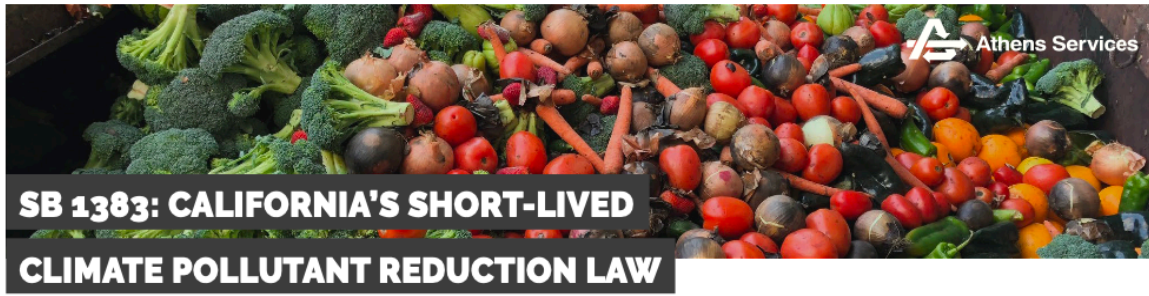
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**(S13) Watch the video: How should we properly dispose of organic waste?**

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APPENDIX A



**Tackling Greenhouse Gas Emissions by Recycling Organics Waste**

SB 1383 targets the reduction of methane emissions from landfills. The law establishes a target of 50% by 2020 and 75% by 2025 in the reduction of statewide disposal of organics waste. It also requires that 20% of currently disposed edible food be recovered for human consumption by 2025. Landfills are the third largest source of methane in California. Organics waste emits 20% of the state's methane; a climate super pollutant up to 84 times more potent than carbon dioxide.



**Who & When Must Customers Comply?**  
Starting January 1, 2022, all residents and businesses in California must separate organics waste into a separate green organics container.



**How Do I Comply?**  
SB 1383 requires residents and businesses to arrange for organics waste recycling services.



**What is Organics Waste?**  
Organics waste includes food scraps, yard trimmings, and 100% fiber-based food-soiled paper.

ACCEPTABLE ORGANICS WASTE			DO NOT INCLUDE	
<b>GREEN WASTE</b> <ul style="list-style-type: none"> <li>Flower &amp; hedge trimmings</li> <li>Grass clippings</li> <li>Leaves &amp; branches</li> <li>Lumber, scrap wood, &amp; plywood (not painted or treated)</li> <li>Weeds</li> </ul>	<b>FOOD SCRAPS</b> <ul style="list-style-type: none"> <li>Bread, rice, &amp; pasta</li> <li>Cheese &amp; dairy</li> <li>Coffee grounds &amp; filters</li> <li>Fruits &amp; vegetables</li> <li>Flowers &amp; herbs</li> <li>Meat, bones, &amp; poultry</li> <li>Seafood &amp; soft shells</li> <li>Pet food (non-medicated)</li> </ul>	<b>FOOD-SOILED PAPER*</b> <ul style="list-style-type: none"> <li>Food-stained paper</li> <li>Paper egg cartons</li> <li>Paper napkins &amp; kitchen towels</li> <li>Pizza boxes</li> <li>Plates</li> <li>To-go boxes (no coating)</li> <li>Wooden &amp; fiber-based utensils</li> </ul>	<ul style="list-style-type: none"> <li>All plastics**</li> <li>Cacti, succulents, &amp; yucca</li> <li>Compostable plastics (bioplastics)**</li> <li>Coffee cups &amp; pods</li> <li>Fats, oils, &amp; grease</li> <li>Food stickers (please remove)</li> <li>Gloves</li> <li>Hard shells (clams, mussels, oysters)</li> <li>Medication</li> </ul>	<ul style="list-style-type: none"> <li>Palm fronds</li> <li>Paper napkins &amp; towels with cleaning chemicals</li> <li>Parchment &amp; wax paper</li> <li>Pet waste</li> <li>Rocks &amp; soil</li> <li>Rubber bands &amp; twist ties</li> <li>Tea bags</li> <li>Textiles</li> <li>Tissues &amp; wet wipes</li> </ul>

\*Must be 100% fiber-based. NO materials with petroleum based plastic, wax, or bio-plastic coating, liner, or laminate.  
\*\*Plastic and bioplastic "compostable" bags are accepted in the organics container, but must be CLEAR or translucent-green, and bag contents must be visible. Acceptable organics will be processed, but the bags will not be recycled or composted.

Edible Food Generators (considered Tier 1 and Tier 2) must recover the maximum amount of edible food that would otherwise be disposed of, arrange for food donation and collection through contracts or written agreements with food recovery organizations or services, and maintain food donation records.



**TIER 1 BUSINESSES**  
Effective January 1, 2022

- Food distributors
- Wholesale food vendors
- Food service providers
- Grocery stores and supermarkets (10,000 square feet or greater)



**TIER 2 BUSINESSES**  
Effective January 1, 2024

- Hotels with at least 200 rooms and an on-site food facility
- Restaurant facilities (5,000 square feet or larger, or seating more than 250)
- Local education agencies with an on-site food facility
- Healthcare facilities with an on-site food facility and 100+ beds
- Large venues (including shopping centers and malls) and events with 2,000+ daily visitors

SCAN TO LEARN MORE:

Call (888) 336-6100 to arrange for a free organics recycling assessment for your business.

# Recycling and Organics Recycling Guide for Schools

If you are receiving this, you have been identified as subject to California's mandatory recycling laws.

## Mandatory Commercial Recycling and Organics Recycling (MCR and MORE)

- Schools and school districts are required to recycle.\*

## AB 827: Educating and Involving Schools to Achieve California's Recycling Goals

- Effective July 1, 2020 MCR- and MORE-covered schools and school districts must provide organics and recycling containers in areas where food is consumed. These containers must be placed adjacent to trash containers.

## Requirements

- AB 827 requires collection containers to be **visible, easily accessible, and clearly marked.**
- This law targets schools and school districts that sell products meant for immediate consumption.

## Resources

Contact your city/county or hauler for more information, or contact CalRecycle at (916) 341-6199.

\*More information about these requirements and related assistance is available at <https://www.calrecycle.ca.gov/Recycle/>

For customizable signage, please visit <https://www.calrecycle.ca.gov/Recycle/Commercial/Organics/PRToolkit/>



19-62



SOURCE: <https://www.sanclemente.org/home/showpublisheddocument/64841/637592663960430000>

## APPENDIX C

### What is Organic Waste?

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.

### The Purpose

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.

### State Law AB 1826

State Law AB 1826 mandated all business and multi-family properties to recycle their organic waste beginning April 1, 2016 depending on the amount of waste generated per week. Recycling organic waste will help reduce greenhouse gas emissions. This law also requires that local jurisdictions across the state implement an organic waste recycling program by January 1, 2016.

### Commercial Organics Requirements

#### Who must comply?

All businesses that produce organic waste may be subject to complying with organic recycling, this includes restaurants, hotels, retail establishments and multi-family residential dwellings of five or more units.

#### How do I comply?

Businesses and multi-family complexes can meet the mandatory organics recycling requirements by taking one or more of the following actions:

1. Source-separate organic waste from all other waste. Contact your waste hauler to arrange for organic waste recycling services.
2. Sell or donate the generated organic waste to an accredited facility, e.g. county permitted food pantries that will redistribute food to those in need.
3. Sign up for an organic waste recycling service that includes mixed-waste processing that specifically recycles organic waste.
4. Recycle organic waste onsite or self-haul organic waste for recycling.

### Organics Recycling Timeline

**April 1, 2016** - Businesses that generate eight or more cubic yards of organic waste must arrange for organics recycling service.

**January 1, 2017** - Generators of four or more cubic yards of organics waste per week are subject to the organic waste diversion requirements.

**January 1, 2019** - Generators of four or more cubic yards of total solid waste per week are subject to the organic waste diversion requirements.

**January 1, 2021** - If organics waste disposal has not been reduced by at least 50 percent, generators of two cubic yards per week of total solid waste are subject to the organic waste diversion requirements.



## Did You Know?

The methane gas generated from food waste is 20 to 25 times stronger than CO<sub>2</sub>. Soil with compost is more nutritious and holds water better, and has more microbes, which makes for healthier soil and protects plants from disease. Recyclable organic waste accounts for about **40 percent** of all the materials California send to landfills each year. Out of the 40 percent of organic material that sits in landfills, **30 percent** could be used for compost or mulch. Every ton of paper that is recycled saves about 17 trees.

## How do I contact my hauler?

Call EDCO Disposal at (562) 597-0608 or visit <https://www.edcodisposal.com/signal-hill> for more information.

## Additional Resources

For additional information, please visit the below California Department of Resources, Recycling, and Recovery (CalRecycle) websites:

[calrecycle.ca.gov/recycle/commercial/organics](http://calrecycle.ca.gov/recycle/commercial/organics)  
[calrecycle.ca.gov/recycle/commercial/faq.htm](http://calrecycle.ca.gov/recycle/commercial/faq.htm)  
[calrecycle.ca.gov/organics/food/default.htm](http://calrecycle.ca.gov/organics/food/default.htm)

