

# Celebrating Earth Day: Recycling Our Waste

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## Introduction & Background

Reducing our solid waste is key to living within our ecosystem limits. Increased amounts of solid waste has resulted in more landfill creation which could potentially lead to overflow and increase in methane. The United States Environmental Protection Agency released a report in 2016, indicating that Americans generated about 254 million tons of trash, but only recycled and composted 34% of this total. Taking a look at California, 63% of the total municipal waste is organic, paper, and plastic materials which can be recycled (Figure 1). Of these materials, the biggest offenders are paper packages, plastic packaging/bags, and food waste (non-meat) (CalRecycle 2020). Specifically, composting serves as a good way to reuse not only organic waste, but also paper waste. Things like cardboard, newspaper, eggshells, coffee grounds/filters, and even dryer lint from cotton fabrics are good compostable materials (Berry 2020). The remaining portion of materials that are not compostable can either be recycled, reduced, or replaced with sustainable alternatives.

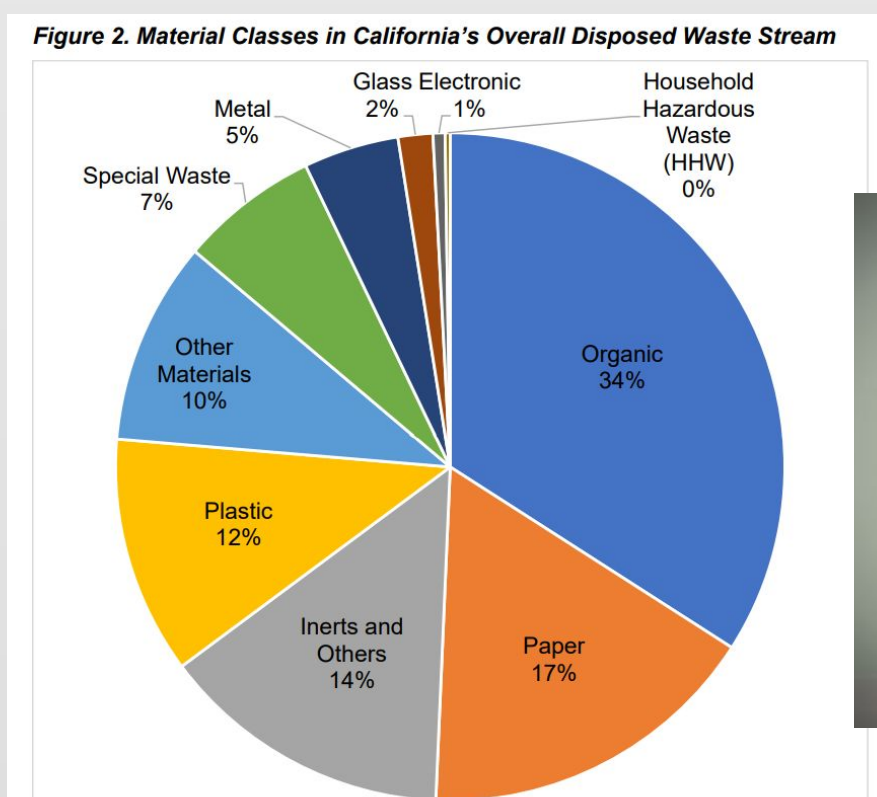


Figure 1. Retrieved from CalRecycle's 2018 Characterization of Solid Waste in California



Retrieved from Giving Compass: "Reducing Plastic Pollution Through Sustainable Takeout"

A recent study has revealed that the COVID-19 pandemic has increased plastic packaging by 40% as people are ordering take-out at a higher rate in regards to safety and convenience and medical waste has skyrocketed up to 370% (Gorrasi and Back 2021). More plastic production not only results in fossil-fuel emissions, but also a rise in microplastics. Microplastic pollution has become a sustainability problem in more recent years as it negatively interrupts the marine ecosystem and can be traced back to our food systems (Patricio Silvia et al. 2021). It's hard to say if plastic production will continue to enlarge as the COVID-19 pandemic continues on, but it still remains our job to find alternative ways starting with our own personal impact. Some strategies include replacing single-use plastics with bio-based/compostable plastics, using paper packaging instead of plastic (easier to recycle), and reusable bags/containers (Patricio Silvia et al. 2021).

In terms of taking a just sustainable approach, some individual strategies may be harder for certain groups of people to partake in such as composting. Composting is time intensive and not everyone has the luxury or access to a garden/yard. People are less likely to want to contribute to composting if they are not actively gardening. We also need to consider people's ability to reduce ordering take-out and buying fresh produce instead. People who live in food deserts may not have the option to buy fresh produce, continually buying take-out which consequently contributes to more plastic pollution. Others may simply be invested in a lifestyle of eating out, or just don't have the time to cook at home. These are all important things to consider when looking at sustainability and its connection to municipal waste.

## Methods

Previous research has revealed that public awareness about environmental protection and education about personal waste contribution has resulted in higher participation in sustainable recycling practices (Mwanza and Mbohwa 2016). For this purpose, we have designed a lesson plan to engage the public to think about their own contribution to the waste stream, in efforts to encourage sustainable practices when managing their own waste.

## Results

In the introduction of our lesson plan, we present a pie chart which explains what the top contributors of municipal solid waste in California are. In explaining these, our audience is able to consider what waste they contribute in their daily lives.

Following this, we present Table 1, provided below, which will let the audience on their typical waste habits and think in depth about what items in their daily lives could be reused, recycled, or composted if they are not already doing so. By filling out Table 1, the audience will be able to have a tangible perception of their personal waste, what they typically do with it along with suggestions for the audience if their answers didn't match up with the suggested action per type of waste.

We also provide a QR code for people to access a mobile version of the chart.

This exercise will also get the audience thinking about manufacturer's contribution of excess waste through excess packaging of item. We introduce an overview of the new Break Free from Plastic Pollution Act with a chance to tell their representatives to support the act through [The Action Network](https://www.actionnetwork.org/)'s website.

We ask the audience the following questions:

- After considering what you threw away yesterday, which of those items fell under the highest contributing categories?
- Did you, or are you able to reuse, recycle, or compost any of those items?
- Is reducing, recycling, or composting within your financial and lifestyle abilities?
- From the items you threw away, which did you consider to have excess packaging that you were unable to avoid?
- Are you aware of the Break Free from Plastic Pollution Act?

By the end of our lesson plan, we would like our audience to be able to:

- Define municipal solid waste and identify the highest contributing categories
- Create links between highest categories of waste and personal contribution
- Explain the measures we can take individually to reuse, recycle, or compost
- Reflect on personal abilities to reduce waste vs. manufacturers' abilities to reduce waste



Scan QR code to access Table 1 below



Retrieved from Infrastructure News

| TYPES OF WASTE   |  |  |  |  | SUGGESTIONS  |
|--|--|--|--|--|--|
| Mixed Paper (white paper, colored paper, newspaper, magazines) |  |  |  |  | These items can be recycled. Most can also be composted if they are clean and shredded.  |
| Used Paper Products (paper towels, tissues, cups, plates)      |  |  |  |  | These items should not be recycled or composted. They might contaminate the recyclables and compost.                           |
| Cardboard  |  |  |  |  | These items can be recycled or composted if they are clean and shredded. If a cardboard box, consider reusing and repurposing. |
| Recyclable Plastics  |  |  |  |  | These items should be recycled if determined recyclable.   |
| Glass Bottles or Jars  |  |  |  |  | These items are reusable as well as recyclable. To reduce waste, consider reusing and repurposing.                             |

Table 1. Table that audience would fill out by checking the boxes whether they recycle, reuse, compost, or throw away the different types of waste.

| Type of Waste   | Mainly Recycled | Mainly Composted | Mainly Thrown Away | Taken to Hazardous Waste Collection Site | Comments   | Ways I Can Make Improvements |
|---|-----------------|------------------|--------------------|--|--|------------------------------|
| Mixed paper (includes white and colored paper, magazines, and newspapers)   |                 |                  |                    |  | These items can be recycled. Most can also be composted if they are clean and shredded.  |                              |
| Used paper products (includes paper towels, tissues, cups, and plates)  |                 |                  |                    |  | These items should not be recycled or composted because they can contaminate the recyclables and compost.  |                              |
| Cardboard and poster board  |                 |                  |                    |  | These items are usually recycled. However, clean cardboard and poster board can be cut into small pieces and composted.                            |                              |
| Recyclable plastics (includes any plastic material that is accepted for recycling by your waste disposal company) |                 |                  |                    |  | Look for recycling symbols to help determine if the item is recyclable. Empty and rinse containers before placing them in the recycling bin.       |                              |
| Glass bottles and jars  |                 |                  |                    |  | Glass containers used for food and beverages are recyclable. Empty and rinse containers before placing them in the recycling bin.                  |                              |
| Aluminum containers   |                 |                  |                    |  | Aluminum containers are recyclable. Empty and rinse containers before placing them in the recycling bin.   |                              |
| Styrofoam   |                 |                  |                    |  | Styrofoam can only be recycled at special facilities. Contact your waste disposal company or local sanitation agency to find out how to handle it. |                              |
| Milk cartons  |                 |                  |                    |  | Milk cartons may or may not be accepted for recycling. Check with your waste disposal company.   |                              |

Figure 2. Retrieved from Project Learning Tree. Example referenced in the creation of our table.

## Discussion

We designed our lesson plan this way because we want our audience, such as students, to engage with environmental stewardship. Our goal is to learn about the impact our waste has on the environment and to include information on what can be recycled and composted, along with easy ways to reduce waste. Being able to describe sustainability, recognize healthy vs. wasteful habits, and identify ways to help minimize waste in our communities are all part of our lesson plan.

Key Concepts

- **Recycle/Reduce:** Collecting and refining items that would otherwise be discarded as waste in order to transform them into new goods. Your society and the world will also benefit from recycling.
- **Reuse:** The process of using products more than once. Recycling is the process of repurposing a commodity rather than discarding it. Consider how our behaviors impact the world as you rethink.
- **Compost:** Organic waste decomposes naturally under oxygen-rich conditions, which is a form of waste disposal. The final compost product, known as humus, is rich in nutrients and can be used to fertilize plants, amend poor soil, and help preserve water.

In the article "Municipal Solid Waste" published by the EPA is where we are able to not only define solid waste but also break it down into several different categories. The article continues to discuss the percentages of each category that is recycled and allows us to see what areas need improvement whether it be at home making different choices in our daily lives or manufacturers and large companies finding ways to reduce their waste. The first step in reducing our solid waste is to analyze our own waste that we as individuals produce daily and what we do with it. In the chart "What we do with waste" provided by Project Learning Tree, we can see the different types of waste and learn what we can recycle, reuse, or compost rather than throwing them away and ending up in our overflowing landfills.

Composting is a luxury that many people don't have the time and or space for. Not everyone has a yard or lush garden to use the compost that they create. But for those who do, or have a community garden where they could drop off their compost to, there is important information on what can and cannot be composted. A previous study we read talks about a step by step guide on how to compost at home and also how long it takes before people can move the compost in to their yard or garden to use as a fertilizer (Berry 2020).

## Conclusions/Policy Recommendations

(MA-05), and Senator Merkley (D-OR) joined together to introduce the *Break Free From Plastic Pollution Act* which focuses on the rising plastic pollution that has been impacting our air, water, and land, along with disproportionately affecting communities of color and low-income (Lowenthal 2021). The *Break Free From Plastic Pollution Act* would require corporations to take responsibility for their plastic pollution by requiring them to manage and finance recycling programs and also incentivize them to invest in reusable products. This is important because while we should be taking our own individual steps to reduce waste, corporations and manufactures should be held accountable as they contribute 41.9% of the total waste in the state of California (CalRecycle 2020).

The overall goal for this lesson plan is to engage students and the public to think about their own individual waste contribution and what steps they can take to either, recycle, reduce, or compost such waste. The more awareness each person has on their own waste contribution will influence and lead to sustainable practices. When we are more aware of the impacts waste has on the environment, we will more likely advocate for better recycling practices while also addressing the issue on a larger scale, such as manufacturers' and corporations' waste contribution. The angle of our lesson plan starts small, by focusing on individual waste which in turn may lead to a larger push in advocacy to participate in sustainable recycling practices such as the *Break Free From Plastic Pollution Act* does.

## For more information

If there are any further questions about our lesson plan please feel free to contact us at any of the following emails:  
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