

# Solid Waste

*by Sophia*



## WHAT'S COVERED

In this lesson, we will cover the topic of solid waste. We will discuss human-generated waste, its numerous sources, and how it has changed. We will also discuss the impacts of solid waste, the many ways to manage waste, and how to mitigate or buffer the negative impacts it can cause. Specifically, this lesson will cover the following:

## 1. Human-Generated Waste

With population growth, human waste generation has increased substantially. Ecosystems function in a cyclic manner, meaning that all waste is recycled to become new resources. Humans used to be a part of this process, but over time, our waste and what we do with it have changed.

Human waste is the only waste on the planet that must be managed and stored because we produce waste that does not recycle naturally. The result is that human waste is accumulating worldwide. Much of our waste is actually just unutilized resources—energy and resources that could still be used and are becoming obsolete because they are trapped in our landfills and dumps instead of being recycled.



## 2. Sources of Waste

There are numerous sources of human waste. Some of the important sources are listed in the table below.

Sources of Waste	Description
Household	Household products, such as furniture, are thrown out because people want a change in style. Instead of being repurposed, household products are taken to the landfill.
Industry	Industry produces large quantities of waste, often as by-products of manufacturing, like polluted water, stack emissions, and useful materials like wood scraps.
Treatment plants	Treatment plants attempt to clean things like wastewater from cities, and they create by-products such as sewage, sludge, and biogas.
Agriculture	Agriculture often produces large quantities of waste, both organic and nonorganic in nature, such as cow manure or broken-down tractors.
Mining	Mining, which provides lots of materials for items like modern-day electronics, produces massive quantities of waste including mined material that pollutes nearby waterways and huge tailings that transform topography.



BIG IDEA

When talking about waste, it is important to note that solid waste includes solid, liquid, and gaseous material. Wood scraps, wastewater effluent, and smokestack emissions would all be considered solid waste.

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### 3. Impacts of Waste

Waste can have a host of impacts. In order to store it, large plots of land must be set aside that could have been used for other purposes such as growing food. Off-gassing from waste in landfills, as well as other sources of waste, contributes to air pollution.

➞ **EXAMPLE** Methane is a primary gas given off by decomposing landfills and is a heavy contributor to climate change. Waste can also produce particulate matter and carbon dioxide emissions.

Waste can sometimes contaminate surface and groundwater when it seeps into water systems, which could lead to human health impacts. In general, waste can damage human and ecosystem health, damaging otherwise healthy populations.

➞ **EXAMPLE** Hazardous waste is a category of waste with special characteristics that make it more dangerous to human health and more difficult to dispose of.



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### 4. Waste Management

There are different ways to manage waste in order to mitigate or buffer the negative impacts it can cause, though not all are created equal. In the past, waste was dealt with according to the whim and desire of those managing it. However, historically, many such practices have led to disease. As a result, in many developed countries, there are now laws and regulations about the management and disposal of waste. In many



developing countries, however, waste management laws are still lax or nonexistent.

In the following sections, we're going to discuss several important strategies used in managing waste.

#### **4a. Landfills**

Landfills take up otherwise usable land to store waste in compacted piles. They contribute to climate change with methane and carbon dioxide emissions, affect nearby communities with their smell, and can seep into water sources, contaminating them.



#### **4b. Combustion**

Combustion, or the burning of waste, may get rid of waste quicker than most management strategies. However, it can release dangerous toxins, impacting human health and adding to air pollution issues.



#### 4c. Ocean/Lake Dumping

Dumping in oceans and lakes can severely impact aquatic system ecosystems, contaminate food chains, and eventually, human health. The photo below shows a section of the Pacific Gyre, which is a state-sized floating pile of trash in the Pacific Ocean.





#### 4d. Reusing

Reuse means repurposing some or all parts of an item or refurbishing it for the same use. In the photo below, a glass bottle is being reused as a building material to bring natural light through the wall.





#### 4e. Recycling

Recycling refers to breaking an item down to its core materials and making something completely new out of it. Below is a photo of a vending machine that collects glass bottles for recycling. These bottles will most likely be broken down and used in some other glass product.



#### 4f. Composting

Composting is using organic waste materials and facilitating their decomposition so they can be added as a soil amendment, ideally to grow more food.





#### **4g. Other Efforts**

In addition to the above, there are other efforts being made to assist the management of waste or to entirely discourage the creation of waste. In many U.S. states, people pay deposits on glass bottles, which are refunded when the bottles are returned and properly recycled.

Some municipalities charge residents for garbage produced, often priced by the can or bag. This is meant to discourage the production of waste in the first place.

Many products are labeled to indicate if they're recyclable, and some places will pay for recyclables like empty aluminum cans.



## SUMMARY

In this lesson, we learned about **human-generated waste**, which has increased in quantity over time, and changed so it's not naturally recyclable. Solid waste includes solid, liquid, and gaseous material. It has many different **sources**, such as household products, industrial waste, and agriculture, to name a few. The range of negative **impacts** of waste are wide, and strategies to **manage** it are many, including **landfills**, **combustion**, **ocean/lake dumping**, **reusing**, **recycling**, **composting**, and **other efforts**.

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