

Bio 2106: Environmental Biology  
Lab 4: Landfills and Recycling  
Lab Requires:\* Part A: 1-2 weeks  
Part B: several days

## Introduction

It is very easy to throw things away- a bottle or can, the wrapper from a bag of popcorn, or the newspaper. Back in the 1950's and 1960's most people thought nothing about throwing away their garbage- land was plentiful, and it was easy for towns to create a landfill for their garbage. Big cities like New York would simply take barges filled with garbage and dump them off shore. But as land around cities became less plentiful and more expensive, cities and towns have created alternative ways of managing their garbage. There are approximately 6 landfill sites in the Central Texas area- some are owned by the city and others are privately owned. As you may know recycling is now mandatory in Austin- any business with more that 100 employees must have a recycling program. Austin has curbside recycling for it citizens -remember those blue containers you see on the curb? In some countries such as Japan, where space has reached a premium, city dwellers must place their curbside garbage in clear plastic bags so the authorities can check to see whether people are recycling as required!

In part A of this lab, you are going to learn a little more about your own personal use of landfill. In part B you will write a 4 page paper about the different types of landfill sites found in Texas.

## Part A: At Home

1. For one week, you need to keep all the garbage that you create, whether it is a soda can from the corner store, the news paper, or your spaghetti dinner. You should have two main categories of garbage: that which is potentially recyclable, and that which if not. Remember that recyclable material includes any thing in the following list:

Plastic jugs and bottles, glass, newspaper, magazines, metal cans. aluminum, cardboard, Styrofoam, plastic grocery bags, foodwaste (see

below, paper, batteries)

2. Separate the garbage from the recyclable material, and measure the amount of material (in cubic feet) each category. Note that the weight of the material doesn't matter- a cinder block and a large plastic bucket take up the same amount of space in the landfill. Some people, (such as my family) compost all our left over food material instead of sending it to the land fill. It is fairly easy to set up a compost area if you have a yard. It is much harder to do in a city apartment. Please make note of which pile (garbage or recyclable) your food refuse goes into. 3. Calculate the amount of room both your garbage and your recyclables would take up in a city landfill over a year (52 weeks). In other words, how many square ft. of real garbage and how many cubic ft. of recyclable material do you create?

Example : if you make Garbage= 10 cu. ft., Recyclable= 5.3 cu f per week

$(10\text{cu. ft} + 5.3\text{cu. ft}) \times 52 \text{ weeks} =$

4. Now, go back through your recyclable materials and separate and measure the amount of space taken up by those items \*you do recycle on a regular basis\* versus those materials \*you could have recycled\* but would have normally thrown away in one weeks time. It is important to be honest here, so that you can see your own effects on a given landfill. For each material you \*don't recycle\*, write down the reason you would have thrown it away. Below are some examples:

Ex. .5 cu. ft newspaper (didn't know you could recycle it)

.25 cu. ft. plastic bottle (bought while driving and too lazy to recycle)

1.0 cu. ft. Styrofoam (Austin curb side won't pick up and you didn't know where to recycle it.

5. Lets say (for simplicity sake) that the average person lives to 80. Based upon your current age, calculate

a. How much "\*real garbage\*" you are likely to generate for the rest of your life (include both the actual garbage and the recyclable

material you throw away)

Ex. 10cu ft. actual garbage + 2 cu. ft of potential that I just throw away= 12 cu. ft. per week X 52 weeks per year = 624 cu. ft. per year of \*real garbage\*

Ex. 624cu. ft per year x 40 years left = 24,960 cu. ft. real garbage in the rest of my life

b. How much garbage will the citizens of Austin generate in a year if they all make "real" garbage like you? You may assume that there are 850,000 people in Austin for your calculation.

Ex. 624 cu. ft. x 850,000people = 531,400,000 cu ft. per year

c. How much room can you now save in the land fill over your life time if you recycle\* all the material you can\*. (real garbage – potential recyclable)

Ex. 24,960cu. ft. - (2 cu. ft. X 52weeks X 40 years) =

d. Finally how much room can the citizens of Austin save in one year if they recycle all that you did in part c?

Ex. 531,440, 000 cu. ft. - (2 cu. ft X 52weeks X 850,000people) =

\*

## PART B.

### 1) Paper on Landfills

Write a 4 page double-spaced paper about the history and types of landfills with a focus on the ones found here in Austin. How did they first originate, and how have they evolved over time? What rules and ordinances govern their location and structure? Hint- There are at least 6 active landfills in the Austin area- as well as many closed landfills, so you should be able to describe their location, as well as their history. For example, in Lab 7 you will visit the old Butler Landfill. What information can you find about it, and the problems it now faces? The information on the landfills is out on the web, so be patient while you look for it. It may take a while to find it all, but it is there!

2) Imagine that you are filling your car with stuff to bring to the landfill. Below is an imaginary list of materials you will toss into your car in the hopes that the landfill will "make it go away". As you research landfills on the web you should be able to find out where each of these materials can go. Thus you will determine whether you can really make it "go away"- or not.

Name of Material

Which Landfill Type Will Accept it?

Where does this material end up (i.e. does the landfill bury it or recycle it or sell it?)

Paint

Refrigerator (you have a really big car)

Ferrous metals

Hazardous waste

Used oil

Tires

Chemicals

Yard trimmings

Tree limbs

Glass

Batteries

