Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Landfill Lab

**Purpose**

To construct and observe a model landfill and investigate the decomposition of various types of waste.

**Background**

There are currently over 3,000 active landfills in the US and an estimated 10,000 dumps that are currently out of use. Modern landfills require two liners that are at least 1/10 of an inch thick each. Surveys have indicated that the majority of landfills had leachate leaks. Leachate is the liquid that percolates through the trash and soil through the bottom of a landfill. This liquid can contaminate local water supplies and bodies of water.

It is estimated that much of the synthetic materials inside of landfills could never breakdown while the natural materials break down at very slow rates. William Rathje, professor of Archaeology at University of Arizona has discovered newspapers from the 1950s in landfills that are still readable.

**Question**

* What happens to trash in a landfill?
* What materials prevent leachate from getting through the landfill?

**Materials**

* Trash- paper, plastic, food, foil, oil, etc
* 2 liter soda bottles
* Scissors
* Soil, sand or clay
* Plastic wrap
* Rubber band



**Procedure**

1. Form groups of three or four at your lab table.
2. Form a hypothesis for each lab question.
3. Cut your 2 liter soda bottle in half.
4. Plug the pour spout with a paper towel.
5. Pour a layer of soil, sand, or clay over the paper towel.
6. Add a layer of one type of trash.
7. Pour a layer of soil, sand, or clay over your trash.
8. Repeat steps 6 and 7 until you have a layer of each type of trash.
9. Cover the opening of your landfill model with plastic wrap attach a rubber band.
10. Spray each landfill with water every class period to simulate rainfall.
11. Observe your landfill every class period for three weeks.

**Data Table of Observations**

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| --- | --- | --- | --- | --- | --- | --- |
| Date | Papers | Plastics | Food | Metals | Other | Leachate |
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| Date | Papers | Plastics | Food | Metals | Other | Leachate |
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**Reflections Questions**

1. What materials decomposed the most?
2. What materials decomposed the least?
3. What materials would you recommend landfill engineers use to prevent leachate leaks?
4. Do you think we should be putting as much material as we do into landfills? What issues do you see with this practice? What suggestions do you have?