

LANDFILL IN A BOTTLE



Supplies:

- an empty plastic bottle
- soil (from outside, or potting soil)
- clay, or play dough
- plastic wrap (or clear plastic headed for the trash)
- cotton balls
- gravel (from outside, or aquarium gravel)
- trash from the recycling, trash can or compost bin
- small plants or grass seed (optional)

Directions:

First, you will need to cut the top off of the plastic bottle. This will be the container you build your model in.

The first layer of your landfill will be soil. The base of the landfill is the natural soil of the land that the landfill is placed on. It is very important to make sure that any toxins in runoff water, or leachate, from the garbage do not end up in the native soil and groundwater.

The next layer is compacted clay, or in our case, play dough. The clay in a modern day landfill provides a barrier to prevent leachate from entering the groundwater and helps gases to escape.

The third layer of the model is plastic wrap. It represents the geomembrane: a thin plastic sheet that prevents leachate from draining from the landfill.

Pull apart cotton balls thin to represent the geotextile layer. This is part of a system that uses pipes (not included in the model) to separate solids and liquids in the runoff from the landfill. The geotextile fabric prevents the pipes from getting clogged.

The fifth layer is gravel. The gravel layer is what collects the leachate.

Its time for trash. In a working landfill, the trash layer is covered with soil daily. Add at least two layers to your model. You can add more if space allows.

Once a landfill has reached a certain height, it is closed down. There is another layer of clay added to the top of the last trash/soil layer.

Another geomembrane (plastic wrap) is added.

Add another layer of gravel that serves as drainage.

The landfill is topped off with soil and grass. You can use grass seed.

Now watch your model. Ask yourself:

- What happens to the trash over time?
- Do you notice anything changing?
- Can air and water get all the way through your model?
- How is this like a real landfill?
- What pieces of trash could have been recycled or composted?