EDIBLE LANDFILL

Students learn about the various components of a landfill while making a tasty snack.

Objectives:	**Duration**: One class period (about 45 minutes), some preparation time needed (about 15 minutes)
• Define a landfill • List the various layers of a landfill • Describe the purpose of each landfill layer • Discuss sustainable alternatives to landfills	**Intended Audience**: 3rd-5th grade **Materials**: Enough of each of the following to feed your students: graham cracker crust (or crushed graham crackers), tootsie rolls, fruit roll-ups, licorice, vanilla pudding with chocolate chips mixed in, crushed Oreos, coconut flakes colored green with food coloring

Background:

Landfill—A method for final disposal of solid waste on land (www.epa.gov)

Municipal landfill—A landfill which disposes of domestic/residential and non-hazardous waste including garbage, paper, etc. (www.epa.gov)

Landfill layers—listed from bottom layer to top layer

- Subsoil—naturally occurring clay, usually about ten feet
- Clay—two feet added on top of subsoil
- Plastic synthetic liner—keeps contaminated liquid (leachate—a toxic liquid produced by movement of rain through the waste) in the landfill; this liner is impermeable
- Leachate collection pipes—collect leachate to pump out and process through the clean water plant before releasing into the ground water
- Fabric layer—covers the leachate pipe and begins to filter the leachate
- Sand—several feet of sand cover the fabric layer and leachate pipes acting as a natural filter system
- TRASH and DIRT layers—trash is added daily and covered with dirt
- Soil/clay—once full, layers of soil/clay seal in the trash and keep rain out of the landfill
- Monitoring wells—built into the landfill to monitor methane gas, another byproduct of trash decomposition in the landfill

Landfills are important to contain trash and keep dangerous substances such as leachate and methane gas out of our environment. Until we live in a world with no trash or waste, landfills will always be needed. Sustainable alternatives to landfills include reducing, reusing, and recycling; waste to energy facilities (incinerators that produce electricity from trash); creating a circular economy rather than a linear economy;

Procedure:

- Before activity—

Color coconut flakes with green food coloring. Mix the vanilla pudding with the chocolate chips. Crush graham crackers and Oreos if you buy them whole.

- Introductory activity—

Have students draw a landfill either in groups or individually. Discuss various questions about what a landfill is and what goes into it. Come up with a class definition of a landfill.

- Building your landfill—

Refer to background information for details about the layers of landfills. Walk the students through building an edible landfill as you describe the various layers.

Line the container with graham cracker crust (the hole dug in the ground for the landfill). Add smashed tootsie rolls (the clay liner) and fruit roll-ups (the plastic liner). Next place licorice (leachate collection pipes) on the fruit roll-ups and then cover with the pudding and chocolate chip mixture (trash layer). Cover with crushed Oreos (soil covering) and coconut flakes (grass that finally grows on top of a closed landfill). Stick a few more pieces of licorice vertically (methane monitoring wells) and your landfill is complete!

- Wrap-up—

Discuss what alternatives there are to landfilling our waste. Come up with a list of sustainable practices as a group. What is one action that you plan to take to decrease your waste and send less trash to the landfill?

Variations:

- Start a day early and have your students collect all their trash from one day and carry it with them in a bag. Use this visual trash as a starting point for discussion about waste. Come back to this visual example at the end of the lesson to discuss more sustainable habits.
- Make single-serving landfill cups by buying crushed graham cracker instead of a pie plate, just be sure to consider your waste when making these. Will you recycle the cups? Will students bring their own dishes from home?
- Build a landfill out of non-food items, so that you can keep it on display in your classroom forever.

Questions to investigate:

- What is the purpose of a landfill?
- Do we need landfills?
- What would happen if the world runs out of space for landfills?
- Do landfills help or hinder pollution?

Extensions:

- Visit South Kent Landfill for a tour. During this tour (weather permitting) your bus will drive to the working face, right on top of the trash! Book your tour at www.reimaginetrash.org/learn/facility-tours.