



# Lesson Plan: Recover, Grade 1 Science and Technology

## Activity

Energy makes things happen!

## Introduction

To keep the environment clean and healthy, we should create as little garbage as possible. The health of the environment benefits from the waste management programs operated by the Region of Durham. It is important to first sort your waste properly into blue boxes, green bins, and garbage bags to make sure materials that can be recycled and composted are kept out of the garbage bag. The garbage we create at home within the Region is sent to the Durham York Energy Centre (DYEC). Here, garbage is burned at high temperatures, making sure to protect the environment and the community, to decrease how much garbage is sent to landfill and to create electricity. This electricity can be used to power our homes, schools, and businesses!

## Curriculum Connections

### Science and Technology, 2022 (revised)

- Strand A: STEM Skills and Connections
- Strand C: Matter and Energy

### Social Studies

- Strand A: Heritage and Identity: Our Changing Roles and Responsibilities
- Strand B: People and Environments: The Local Community

## Learning Objectives

1. Identify the kinds of waste materials produced by humans
2. Identify waste diversion programs at school and at home, and how to sort these materials (blue box, green bin, garbage)
3. Describe everyday uses of energy at school and at home, and suggest ways to use energy responsibly
4. Demonstrate an understanding that energy is the ability to move or change something
5. Identify items around school and home that require energy in the form of electricity
6. Demonstrate an understanding that garbage can be used to create electricity that can be used at home and at school

## Resources Provided

- Module: Recover

## Materials Required

- 1 or 2 items that require electricity (i.e., a toaster)

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## Activity Instructions

1. Have a discussion with the class about waste within their homes and classrooms.

To keep the environment healthy, we should create as little garbage as possible because garbage doesn't disappear when we put it into a garbage bag. It must go somewhere when it leaves our schools and our homes. We have waste management programs in our community (where we live) - like recycling, composting, and garbage collection - to make sure our garbage is taken care of in a way that protects the environment. It is important to properly sort your waste into blue boxes, green bins, and garbage bags to keep materials that can be recycled and composted out of the garbage.

2. Explain that we sort our waste by items that have been made with similar materials. Providing examples of some common waste materials and exploring their similarities can help students visualize this concept.

We have two blue boxes, one for containers (like drink cans, plastic bottles, glass bottles and jars, and yogurt containers) and one for fibers (like school papers, cereal boxes, newspaper, and cardboard boxes).

The green bin or backyard composter is used for things that used to grow or were once alive, like fruit and vegetable scraps, animal bones, plants, and even our hair and fingernails! Even after we have sorted the waste we create at home and school into the blue box and green bin, we can still have some garbage left over.

3. Share some examples of common items that would go in the garbage. This includes items like plastic straws (this includes the straws from juice boxes), single-use plastic utensils like spoons and forks, plastic bags like milk and bread bags, candy wrappers, chip bags, and single-use cups used for coffee, tea and hot chocolate.
4. Explain that while the best option is to not create this waste in the first place (by rethinking reducing, reusing, recycling, and composting) we can use the left-over garbage to recover energy that can power our homes, schools, and businesses.
5. Introduce energy.

**Energy** is the ability to do work. It is how things change and move. It's everywhere around us and takes all sorts of forms like heat, light, and sound. Today we are going to talk about electrical energy (electricity). Every time you plug something into a wall outlet, you are using electrical energy to power those items. Many of the items we use every day need electrical energy to function.

6. As a class, create a list of items that need electric energy to work. Hint: think about all the items that the plug into a wall outlet, have a switch to turn them on, and items that need a battery.
7. Explore one or two items that require energy with the class and make observations, i.e., a toaster.

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Sample observations for a toaster:

- The toaster is cold when it is unplugged
  - The toaster needs energy to work
  - To get energy, the toaster must be plugged into a wall outlet which provides electricity
  - When the toaster is plugged in, it gets hot (converting the electric energy from the outlet into heat energy)
  - We can see the inside of the toaster glow red (light energy)
  - We can hear the toaster hum (sound energy)
8. Explain that we get the energy we need from the world around us. Some of the sources of energy will run out or take a long time to replace – longer than our lifetime! That’s why it is important to use energy responsibly.
9. Provide examples of using energy responsibly.
- Only turn on lights when you need them
  - Turn off lights when you leave a room
  - Hang wet items like towels or mittens to dry instead of using a dryer
  - Don’t leave your electronics on – turn off computers or gaming systems when you are not using them

## Summary

While the best option is to not create waste in the first place (by rethinking, reducing, reusing, recycling, and composting) we can convert the garbage that is left over into a source of energy. Garbage is collected and brought to a facility (DYEC) where it is burned at very high temperatures, making sure to protect the environment and the community. The heat from the garbage is used to create electricity to power electrical items like the ones you listed earlier!

## Expanded Curriculum Connections

Grade 1, Science and Technology, 2022 (revised)

### A: STEM Skills and Connections

#### A1. STEM Investigation and Communication Skills

- A1.1 use a scientific research process and associated skills to conduct investigations
- A1.2 use a scientific experimentation process and associated skills to conduct investigations

### C: Matter and Energy

#### C1. Relating Science and Technology to Our Changing World

- C1.1 describe everyday uses of energy at school and at home, and suggest ways to use energy responsibly

#### C2. Exploring and Understanding Concepts

- C2.1 demonstrate an understanding that energy is the ability to move or change something
- C2.4 identify everyday uses of various sources of energy
- C2.5 demonstrate an understanding that humans get the energy resources they need from the world around them, and that the supply of many of these resources is limited

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## D. Structures and Mechanisms

### D1. Relating Science and Technology to Our Changing World

- D1.1 identify the kinds of waste materials produced by humans, and plan and carry out a course of action for minimizing waste in the classroom or at home, explaining why each action is important
- D1.2 assess everyday objects, including structures, that have similar purposes in terms of the materials they are made from, the source of these materials, and what happens to these objects when they are worn out or no longer needed