

Stored Energy in a Corn Chip



Essential Question: Explain the evidence that corn chips contain energy.

Overview

Since it is difficult to actually build a power plant within your classroom, you are going to model how a power plant works. You will demonstrate energy transformation using something more common – corn chips. By burning corn chips, you will see the amount of energy that is contained inside them. You will see that burning corn chips is also a transformation of energy.

If you burn a corn chip, it will give off energy in the form of heat and light. To measure the amount of heat given off, we will use the heat energy from the corn chip to heat a container of water. By measuring the temperature change of the water, we can calculate the amount of heat given off by the corn chip. The following formula measures the amount of heat.

Mass of water (grams) x temperature change (°C) = Calories in the corn chip (cal)

The calories that you see on food labels are actually kilocalories, or 1000 Calories.

Materials

For the class:

- 1 bag of corn chips
- 1 electronic mass scale
- 1 ball of string
- 1 box of kitchen matches
- access to water

For each group:

- 1 wire hanger
- 1 roll of aluminum foil
- 1 pair of needle-nose pliers
- 1 empty aluminum can with pull tab attached
- 1 ringstand
- 1 burette clamp for ringstand
- 1 plastic, 100-mL graduated cylinder
- 1 alligator clip
- 2 thermometers

Safety Concerns

Follow standard safety rules and school safety rules for laboratory activities.

Procedure

1. Follow your teacher's instructions for assembling and using a calorimeter.
2. Record the mass of the corn chip in grams in your notebook.
3. Carefully attach the alligator clip to the corn chip. (If the corn chip falls apart, use another one.)
4. Fill the calorimeter with 50 mL of water.
5. Just before burning the corn chip, record the temperature of the water.