



## Unfield Trip Resources Pre-Visit Activity

### Alarming

**Pre-visit activity** connection to the Nickelodeon Play Lab

**Grade level/standards:** **4<sup>th</sup> grade** NGSS 4-PS3-2, 4-PS3-4, CCSS W.4.2

#### **Concepts:**

Electric current, batteries and voltage

#### **Materials needed:**

1. Book "Dear Mr. Henshaw" (This book is about how Leigh Botts finds that someone is stealing food from his lunch so he decides to catch the culprit by setting an alarm in his lunch box. His journal carefully details all the steps of the process.)
2. Old flashlights one for each group of four

#### **Procedure:**

1. Have the students take apart an old flashlight to discover how it works.
2. Have the students diagram the parts of the flashlight as they take it apart.
3. Discuss with the students how a circuit is formed with the battery.
4. Read the book "Dear Mr. Henshaw" to the class or at least the diary entries for Thursday, March 1, through Saturday, March 24. (This is the part where batteries are discussed.)
5. Have the students illustrate plans for developing an alarm system for something they have at school that they want to protect. The alarm system must use a battery. Write a description of how the alarm system will work.

#### **What's Happening:**

While there are many different types of batteries, the basic concept by which they function remains the same. When a device is connected to a battery, a reaction occurs that produces electrical energy. This is known as an electrochemical reaction.

There are three main components of a battery: two terminals made of different chemicals (typically metals), the anode and the cathode; and the electrolyte, which separates these terminals. The electrolyte is a chemical medium that allows the flow of electrical charge between the cathode and anode. When a device is connected to a battery—a light bulb or an electric circuit—chemical reactions occur on the electrodes that create a flow of electrical energy to the device.

**Book List:**

1. Batteries, Bulbs, and Wires: Science Facts and Experiments by David Glover
2. The Energy Bus for Kids
3. Charged Up by Jacqui Bailey

**Extension Activities:**

1. You have been asked to head an advertising campaign for a battery manufacturer. Design a “battery mascot” using appropriate software and write a slogan for your campaign.
2. Write a letter to Leigh Botts describing your alarm system. How were your experiments the same or different? Are there things either of you should change if you do this again?