Exploring How to Make a Battery

Re-Energy
Spiral Inquiry Activity
Grade Level 7-12

Now that you know all about energy storage it's time to take that learning into action! Spread the word about energy storage and create a positive change in your community.

Main Objectives

Learners will explore battery types for energy storage.

Learning Outcomes

By the end of this activity, learners will:

- Utilize GreenLearning's Spiral Inquiry Model to answer the question: How can we make our own battery to better understand the benefits of energy storage in our community?
- Collaborate amongst peers to develop their own focus question(s) and inquiry plan

Curriculum Connections

Alberta

Science 7: Interactions and Ecosystems
Science 8: Mic and Flow of Matter
Science 9: Matter and Chemical Change
Science 9: Electrical Principles and Technologies
Science 10: Energy and Matter in Chemical Change; Energy Flow in Technological Systems; Energy Flow in Global Systems; Stewardship
Science 11: Science Technology and Society
Science 12: Chemistry and the Environment; Energy and the Environment
Social Studies 10-1: To what extend should we embrace globalization?

- 10-2: Living in a Globalizing World

Length of Activity

5 - 7 hours

Materials List

Internet-enabled device
Chemical Energy Storage Backgrounder
Exploring How to Make a Battery Inquiry Worksheet
Desired battery materials based on research

Before you begin: This activity requires you to have completed the energy storage backgrounders and at least one lesson with your learners. It is recommended that learners complete the Build a Penny Battery activity in advance. This will ensure learners should have a solid understanding of energy storage before beginning the activity.

Step 1:
Spark (A Student Investigation)

a. Begin by getting familiar with GreenLearning's Spiral Inquiry Model found here: https://programs.greenlearning.ca/course/spiral-inquiry-model
a. Pose the question "How can we make our own battery to better understand the benefits of energy storage in our community?"
    I. Allow learners to break out into think-pair-share groups to begin generating some ideas.

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II. Ask the groups to share their ideas, and record down their responses in a bullet list at the front of the class on the board.
III. Each bullet can be discussed at large with the class by providing them with some teaser information on those points so it really gets them thinking further.

Step 2: Hypothesize and Plan

a. Have a classroom discussion about the basics of making a battery. Reflect on what was learned in the previous activities.
b. Have the learners come up with a hypothesis of how to make the best homemade battery.
c. Have learners think of what components make the best battery as well as the environmental impacts on the different types.
    I. ***Note:*** Please do not plagiarize an existing plan for a battery but use existing ones for researching purposes.
d. Have learners think of how they can modify/improve.
e. Hand out the "How to Make a Battery Inquiry Worksheet" to the learners in their groups and allow them to complete Part 1.

Step 3: Explore and Research

a. Have learners research different types of homemade batteries and the material they will need to make it.
    I. Encourage the learners to use recycled materials where possible.
    II. Get the learners to write out the materials they need and have them bring it to you for approval.
b. Hand out the "Exploring How to Make a Battery Inquiry Worksheet" to the learners in their groups and allow them to complete Part 2. Be sure to remind learners to record their information and remember to keep track of their sources.
c. Groups can evaluate their information they have collected and answer these questions:
    i. Does your research answer your questions or test your hypothesis?
    ii. Does it raise more questions, and how can you answer these?

Step 4: Analyze and Check

a. Have learners create their battery. Do they need any modifications to their original design?
b. Hand out the "Exploring How to Make a Battery Inquiry Worksheet" to the learners in their groups and allow them to complete Part 3.

Step 5: Communicate

a. Now the learners are ready to turn their knowledge into action. Have learners present their batteries to each other.
    I. Learners can participate in a friendly competition of whose storage device lasts the longest.
b. Have the learners communicate their findings to the class. Some ideas include:
    I. Making a PowerPoint presentation
    II. Creating an infomercial/commercial/podcast
    III. Making a bulletin board presentation

Extension Idea

- Have learners present their batteries to younger grades in their school to teach them about energy storage and provide them with a working example.

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