

Overcharging Batteries and Fires

The primary goal of this Learning Experience is to raise awareness about the causes and prevention of fires resulting from battery overcharging, promoting scientific curiosity, critical thinking, and environmental responsibility among children and youth. Through hands-on and discussion-based activities, students explore real-life examples of how improper battery use can lead to accidents, learning to apply science-based knowledge to everyday safety and community well-being.

Context: This Learning Experience was implemented during a summer community education program, reaching 43 children (ages 4-12), eight youth leaders (ages 13-19), and five adult Community Health Workers (CHWs). The lesson was delivered in an informal education setting with a total duration of approximately 1 hour and 20 minutes. It was designed to support STEM literacy, community safety awareness, and environmental stewardship, integrating science concepts into real-life applications through visual and participatory learning. The mixed-age, community-based structure fostered intergenerational learning and leadership, aligning with public health and STEM education objectives.

Instructional Phases	Connection & Context	Research & Understanding	Co-Creation of Solutions	Implementation of Action	Reflection & Projection
<p>Visual Storyline</p>					
<p>Objectives</p>	<p>Students demonstrate understanding of the causes of thermal runaway in batteries. Children and families recognize the importance of safe charging practices. Participants engage in environmental responsibility by collecting and properly disposing of used batteries. Youth leaders and CHWs enhance their facilitation and science communication skills.</p>				
<p>Timing</p>	<p>≈ 20 minutes</p>	<p>≈ 30 minutes</p>	<p>≈ 30 minutes</p>	<p>Variable</p>	
<p>AOP Alignment</p>	<p><i>Imagining Preferred Futures</i></p>	<p>Systems Thinking</p>	<p>Collective Orientation</p>	<p>Authentic Participation</p>	<p>Building Realistic Hope</p>

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<p><i>Overview</i></p>	<p>Students were introduced to the lesson topic through guiding questions about everyday battery use and potential hazards. This phase invited them to imagine a safer future by understanding how simple daily actions (like charging devices correctly) can prevent fires. It sets a personal and community-based vision of safety and responsibility.</p>	<p>Through guided explanations and exploration of Xplorlabs' <i>Thermal Runaway</i> materials, participants analyzed how batteries work, what overcharging does at a chemical level, and how multiple factors (device design, voltage, user behavior) interact within a larger safety system.</p>	<p>Youth leaders, children, and Community Health Workers collaboratively discussed preventive actions and interpreted the <i>Scooter Overcharge</i> and <i>Drop Zone</i> videos. Together, they identified causes and co-created lists of safe charging habits and home practices to reduce fire risk.</p>	<p>Participants applied what they learned by taking real action: discussing safety at home, recycling used batteries, and modeling correct behaviors. Some families brought used batteries to dispose of properly, demonstrating that knowledge moved into authentic community practice.</p>	<p>In follow-up conversations, students shared stories of how they changed behaviors and influenced their families. Reflection focused on how small, informed actions can create meaningful community impact and a hopeful, safer environment for all:</p> <ul style="list-style-type: none"> • “What did we change in our community?” • “What still needs to be done?” • “What role will I play next?”
<p><i>Supporting Documents</i></p>	<p>Xplorlabs Thermal Runaway Pathway: https://xplorlabs.org/pathway/thermal-runaway/</p> <p>Videos of students engaging with lesson content (1) (2)</p>		<p>Videos of student explaining lesson content to a parent (1) (2)</p> <p>Article highlighting community involvement: https://edforplanetaryfutures.substack.com/p/follow-ups-from-the-xplorlabs-educator</p>		