Educator How To Hub: Go Further

Request Lab Materials or Equipment Donations

Relevant Learning Levels

✓ Primary ✓ Secondary ✓ Post-Secondary

WHAT'S THE BENEFIT OF LABS?

Hands-on learning activities help students apply STEM skills and explore energy and environmental systems in meaningful ways. Whether it's testing water samples, building simple circuits, or growing native plants, access to real materials transforms classroom learning. While budget limitations can be a challenge, many businesses, utilities, and grant programs are willing to support educators providing these experiences..

Hands-on lab activities in Energy & Natural Resources (ENR) help students:

- Develop scientific thinking and engineering skills
- Connect classroom concepts to environmental challenges
- Explore sustainability, resource use, and energy systems
- Engage in meaningful, inquiry-based learning

START HERE

1

Lock In Your Project Idea

- Choose a project tied to a topic your classroom is currently learning about — for example, water cycles, energy transfer, or sustainable agriculture
- Frame each lab around a driving question or real-world problem that sparks curiosity and critical thinking
- Clearly define what students will do (e.g., build, test, observe, record), what they're expected to learn, and what specific materials or equipment will be required to bring the project to life.

2

Make a Materials Wish List

- Create a list with item names, quantities, and costs
- Prioritize items into categories like “essential,” “bonus,” or “replacement” in case only partial funding is available
- Don’t forget to consider equipment donations, such as pumps or valves to be converted to cut-a-ways

3

Connect with Donors

- Leverage local connections by contacting nearby businesses, utilities, or environmental organizations directly. When contacting them, use a professional Letter of Request (example on the GIE Educators Page) that outlines the activity, needed materials, and how it will support student learning

4

Explore Additional Grant Funding

If local donors aren’t available, consider applying for small grants. These often require only a short description of your instructional activity.

Potential sources include:

- Local electric or gas utility education departments
- Regional conservation districts or watershed councils
- Your school or district’s STEM/CTE coordinators
- Parent-teacher associations (PTAs)
- DonorsChoose.org

5

Show Impact & Say Thanks

Once students are engaged in the activity, document the experience:

- Take photos (with proper permissions) and collect student quotes
- Send a thank-you message or email to donors, including images or reflections
- If appropriate, tag businesses or organizations on social media to highlight community engagement
    - Expressing appreciation builds long-term support for future needs

Lab Ideas

Primary	Secondary	Post Secondary
Simple, sensory, and exploratory — focused on observation and basic cause-effect understanding.	More complex experiments, data collection, and application to real-world systems.	Labs should align with technical training, certifications, or deep systems analysis.
• **Build a Solar Oven:** Use cardboard boxes and foil to cook s'mores while learning about solar energy and heat • **Plant Growth & Soil Lab:** Compare how plants grow in different soil types to explore conservation and land management • **Recycling Sort & Weigh:** Students categorize classroom waste and measure how much could be recycled to introduce waste management • **Water Filtration Challenge:** Design a basic filter using sand, gravel, and cotton balls to simulate cleaning dirty water • **Wind Power Pinwheels:** Create pinwheels and test them with different wind sources (fans, breath, outdoor breeze) to explore wind energy	• **Energy Audit of the School:** Students measure lighting and appliance usage to calculate energy consumption and propose savings • **DIY Solar Panels or Wind Turbines:** Assemble small models and test power output under different conditions (e.g., light intensity, fan speed) • **Stream Water Quality Testing:** Collect and analyze local water samples for pH, turbidity, nitrates, and temperature • **Carbon Footprint Calculator:** Use online tools or worksheets to track personal or school emissions and explore behavior-based reduction strategies • **Land Use Simulation:** Model competing uses of land (agriculture, conservation, development) and evaluate trade-offs in a group scenario	• **PV System Design Lab:** Use solar simulation software or real equipment to design and test a grid-tied solar installation • **HVAC Efficiency Testing:** Measure temperature, pressure, and flow rate in heating and cooling systems to analyze performance • **GIS Mapping for Conservation Planning:** Use ArcGIS or similar tools to map watersheds, wildfire risk zones, or resource extraction sites • **Environmental Impact Assessment (EIA) Lab:** Conduct a mock EIA on a proposed energy project, incorporating policy, ecological, and social impact layers • **Bioenergy Yield Calculations:** Evaluate the energy potential of different biomass sources and assess feasibility for local generation