

Add an ENR Capstone or Project-Based Learning Course

Relevant Learning Levels

Primary*

Secondary

Post-Secondary

*Only applicable to PBL

Hands-on learning is a powerful way to help students connect academic content to real-world issues and career pathways. Capstone and project-based learning (PBL) experiences allow students to apply their knowledge to environmental and energy-related challenges in their community. These experiences build essential skills—such as problem-solving, collaboration, and communication—while preparing students for life after graduation.

1. UNDERSTAND THE RIGHT FIT FOR YOUR CONTEXT

When deciding which model to implement:

- Consider your students' readiness and schedule flexibility**
Capstone projects often require significant student independence and time; PBL is more adaptable to standard classroom pacing
- Look at where this fits in your program of study**
Capstones work well as a culminating experience in a Career and Technical Education (CTE) pathway. PBL can support ongoing content instruction throughout the year
- Align with school or district goals**
For example, use a capstone to meet a college and career readiness requirement, or a PBL unit to support interdisciplinary learning goals

UNDERSTAND THE TWO LEARNING MODELS

Both capstones and PBL courses are excellent options, but one may better suit your unique learning styles / needs.

Capstone

A culminating experience—often in the final year of a program—where students synthesize learning into an independent or group project

- Duration: Semester or full year
- Best for: Seniors or final programs

Project-Based Learning Course

A structured learning approach where students investigate and respond to real-world challenges

- Duration: 1-6 weeks
- Best for: Flexible for any grade or subject area



2. SELECT TOPICS GROUNDED IN REAL WORLD CHALLENGES

Strong capstone or PBL topics should be relevant, engaging, and rooted in real-world environmental or energy issues.

Focus on:

- **Local Relevance:** Choose topics tied to challenges in your community—this increases student connection and impact
- **Student Voice:** Let students help shape or choose topics to boost engagement and ownership
- **Interdisciplinary Value:** Select topics that overlap with science, math, or civics to deepen learning
- **Right-Sized Scope:** Match the topic to your timeline and student skill level—capstones can go deeper; PBL should be more focused
- **Industry Connection:** Pick topics that allow for real engagement with professionals, site visits, or expert input

3. SECURE SCHOOL & ADMINISTRATIVE SUPPORT

To make these experiences successful:

- Share how capstone or PBL work aligns with graduation requirements or CTE outcomes
- Request any needed schedule flexibility, planning time, or material support
- Identify opportunities for collaboration with science, social studies, or technology teachers

4. SUPPORT & SCAFFOLD STUDENT WORK

- Provide structure: include milestones, checkpoints, and templates
- Coach students in inquiry, research, time management, and self-reflection
- Schedule regular check-ins to guide progress and troubleshoot roadblocks

5. CELEBRATE & SHARE THE RESULTS

- Host a presentation night, school exhibition, or panel pitch session
- Invite families, community members, and industry partners
- Consider publishing final projects on a school website or digital portfolio



DRAW INSPIRATION FROM SOME EXAMPLES

CAPSTONE EXAMPLES

A. Design a Net-Zero Energy School

Students research energy-efficient building designs, model a school powered by solar and geothermal energy, and present to their school board or local architects

C. Carbon Footprint Reduction Plan for Local Business

Students partner with a local business to assess its energy use and propose a cost-effective plan for reducing carbon emissions

B. Watershed Health and Community Impact Report

Students collect and analyze local water quality data, research land use effects, and produce a report for a town council or environmental agency

D. Develop a Wildlife Corridor Proposal

Students identify barriers to wildlife movement in a region and create a GIS-based plan for conservation zoning or corridor placement

PROJECT-BASED LEARNING EXAMPLES

A. Solar Oven Challenge

Students design, build, and test solar ovens using different materials, learning about thermal energy and energy efficiency

C. School Energy Audit

Students collect data on lighting, HVAC, and appliance use in their school and propose realistic steps for saving energy

B. Build a Mini-Wind Turbine

Students explore kinetic and mechanical energy by constructing small turbines and testing blade design for maximum power

D. Simulated Oil Spill Cleanup

Students test materials and methods to clean up a mock oil spill, learning about pollution, ecosystems, and environmental engineering