

Special Projects in Energy Management for Schools

Introduction

Special projects in energy education are hands-on activities and experiences that focus on an energy topic, theme, or issue. Special projects can be used to enhance an existing unit, to introduce a new topic, or to add hands-on learning opportunities to classroom lessons. These projects can be part of the classroom curriculum or an extracurricular activity for a school club or organization.

Benefits of Special Projects

- Special projects often address many disciplines and grade levels.
- They offer parents and other members of the community an opportunity to get involved in the project since students will often need to get information outside the classroom.
- They offer a different technique for teaching which can assist students who learn more effectively by doing hands-on activities.
- Students can become involved in projects that benefit the community which may encourage participation in other community events.

Development of Special Projects

Special project ideas have already been developed by various organizations. See examples of special projects below. Some teachers work with their students to create a special project or a project idea comes from a spontaneous discussion between teacher and students. Whether the idea comes from a recognized source such as the U.S. Department of Energy or from a 7th grade technology education course, it is important that students plan and conduct the project while the teacher acts as a facilitator or guide.

Examples of Special Projects

Create an Energy Committee

Creating an Energy Committee in your school will provide a means to bring together many different people from the school community that are motivated to work together on energy initiatives. The committee members may change over the years, but with an established committee in place, there is a better chance that energy conservation and awareness will continue to be a priority in the district. See page 178 for more information on how to create an energy committee in your school.

Determine Baseline Energy Consumption

Awareness of your building's current energy consumption and the resulting greenhouse gas emissions is an important first step to creating an energy action plan. Information gathered by analyzing your school's energy bills and other basic information about the building and its energy systems will help you prioritize energy efficiency projects and goals, as well as verify and track energy savings goals overtime.

Ask your facilities manager if the school has a recent energy baseline established through Focus on Energy or another energy management service provider. The EPA created ENERGY STAR® Portfolio Manager, an online free tool you can use to measure and track energy consumption and receive a 1–100 ENERGY STAR® score comparing your building's performance to similar buildings nationwide.

Conduct an Energy Audit

Data collected during an energy audit is the best way to determine where your building is losing energy and where you can save. Equipment is used to detect sources of energy loss and analyze building occupant behaviors. An energy audit report identifies areas of improvement and makes recommendations for saving energy and money. Your school administrator might have the results of a professional energy audit conducted by Focus on Energy or some other agency or local utility.

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Students can also conduct their own energy assessment investigations. The following organizations provide teachers and students step-by-step instructions and worksheets to conduct energy audits and empower them to use the data collected to design and lead energy action projects.

- Wisconsin K-12 Energy Education Program (KEEP) Student Involvement: keepprogram.org > Student Involvement
- Project Learning Tree GreenSchools Investigations: plt.org/greenschools
- National Wildlife Federation Eco-Schools USA: nwf.org/eco-schools-usa
- The NEED Project School Energy Survey: need.org
- U.S. Green Building Council Building Learners: learninglab.usgbc.org/programs/building-learners

KEEP provides Energy Audit Kits containing easy-to-use tools to perform simple energy assessments and behavior investigations in the classroom. Monitor and measure plug load (appliances), temperature, humidity, and lighting levels to find energy loss in any building. Kit includes a classroom set of tools. To borrow a kit, contact the Wisconsin Center for Environmental Education's Hands-on Resources Lending Program: uwsp.edu/wcee.

Develop School Energy Policy

Many school communities in Wisconsin have adopted energy management policies that improve a school's operational productivity and reduce costs. A School Energy Policy articulates a school's commitment to energy conservation and efficiency by defining energy management practices for school energy systems such as lighting, temperature control, and personal appliances. One step further, a School Energy Education Plan outlines how energy education will be integrated into each grade level or class and how the school building will be used as a teaching resource. Ask your facilities manager or school board for your district's energy policy.

KEEP provides a School Energy Policy and Education Plan Template to help schools develop or revise their own. See page 180 for more information on how to develop a policy in your school. Visit the keepprogram.org School Energy Policy and Education Plans page to view sample policies from Wisconsin school districts.

Attain Green Building Certification

Achieving certification is not necessary to maintaining and operating a healthy and high-performing building; however, certification programs provide accountability and recognition to guide building maintenance, renovation and new construction. The following are a few of the well-known certification programs for schools.

- ENERGY STAR® for Buildings: energystar.gov
- LEED® for Schools: new.usgbc.org/leed
- WELL Building Standard: wellcertified.com
- Green Globes: thegbi.org/green-globes-certification

Achieve Recognition

Green & Healthy Schools Wisconsin empowers, supports and recognizes schools for nurturing healthy kids and sustainable communities. Public and private PK-12 schools working to reduce environmental impacts and costs, improve health and wellness, and increase environmental and sustainability literacy may report achievements using a web-based reporting tool. Wisconsin participates in the U.S. Department of Education Green Ribbon Schools program. Schools, districts, and early learning centers seeking nomination must submit an online application by December 1 each year. For more information, visit: ghswi.org.

KEEP annually sponsors the Energy Educator of the Year Award to increase the visibility of the network of outstanding educators across Wisconsin empowering students, teachers and community members to make wise energy choices. Nominations are due in February each year. Visit: keepprogram.org for more information.

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Conducting Special Projects

Timing

There are many opportunities to fit special projects into the curriculum. Contents and skills learned while conducting special projects can be used to simultaneously satisfy objectives or learning outcomes for the class. Calendar events and holidays are ideal times to implement special projects. Projects can also be undertaken by students in a club or an after-school group. Although environmental education can and should occur throughout the school year, one technique for learning about a special environmental topic is to dedicate a day or series of days to investigating the topic. Students can develop special projects to highlight an environmental theme and present or implement them on the designated day. One of the benefits of this approach is that often whole schools become involved, with different classrooms taking responsibility for different parts of the event. In addition, there are many opportunities for administrators, parents, and community members to become involved. A word of warning: don't be tempted to consider a single experience sufficient for the students' environmental education for the school year. Make sure students are truly involved in the planning process, so that they understand the reason for their participation. It is important, therefore, to ensure environmental events or celebrations have more than one day of impact.

The most common nationally recognized event that schools celebrate is Earth Day on April 22, but there are many other calendar events which can be chosen. Students can develop special projects that raise awareness of the importance of a particular event or use the date as a springboard to investigate an associated environmental issue or topic. Special projects can also focus on historic events.

Planning and Preparation

Planning and preparation for special projects is challenging but rewarding. The degree of teacher involvement will depend on the motivation and skill level of the students, the nature of the projects, and the teacher's ability to facilitate. Obviously, some students require more guidance than others, but students will develop a stronger sense of motivation and ownership if the process is shaped by their inquiry rather than directed solely by their teacher. Although some risk taking should be encouraged, it is important to remember that it is better for students to start out small and expand later than to attempt a grandiose plan which is too difficult to accomplish. Students will need guidance to remain realistic when planning and undertaking their projects. As a facilitator, the teacher's role is to assist the students through a learning process that includes allowing an occasional wrong decision or circuitous route to reaching a conclusion. Wrong decisions and inquiries that lead to a dead end sharpen the students' critical thinking skills and help them learn from their mistakes. Students' experiences in planning and conducting a special project will help them appreciate the projects' complexity as well as the importance of individual understanding and action. When special projects have realistic, attainable goals and objectives, they are not only educational and rewarding but fun.

Whatever the degree of teacher or student involvement, undertaking a special project requires strong planning and preparation on the part of both the teacher and the students. Although the degree of teacher or student involvement in each of these steps will vary, in general, the following procedure is recommended when planning a project:

1. Evaluate the appropriateness and feasibility of conducting a special project. (The teacher should do this before involving the students.)
2. Determine how a special project will be chosen. Will it be initially assigned by the teacher, or will the students choose the topic and method of approach?
3. Determine and evaluate the environmental topic or issue you would like to investigate. If it is an environmental issue, why is it an issue? What are causes of the issue? Who are the people involved? What are their beliefs and values?
4. Once you have decided on an environmental topic or issue, brainstorm strategies for conducting a project that addresses this topic or issue. What can you do? Develop a list of possible special projects.

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5. Evaluate each of the special projects you have listed. What are the pros and cons of each? Rule out projects that will be unmanageable. Decide which is the most feasible in terms of time, cost, and/or participant support. Which one will most likely be successful?
6. State the purpose of your chosen special project.
7. Describe what you hope to accomplish. What are the goals and objectives of your project?
8. Develop an action plan that addresses why, who, what, when, where, and how.
9. Determine how the project will be evaluated.
10. Do it!

To help teachers and students plan for a special project, several planning activities and forms have been included in the *Energy and Your School* guide. As an aid to teachers, a page entitled “Special Project Considerations for Teachers” lists important questions teachers need to consider before introducing a special project to their students. Additionally the activities “Energy Investigations for School Buildings” (see page 142) and “Energy Action Plan” (see page 147) include planning and reporting forms and evaluation criteria that are designed to help both teacher and students identify and develop a special project plan of action. These forms are intended to provide a framework for project development. They may need to be adapted for specific projects.

Obtaining Support

Depending on the scope of the special project, it may be necessary to obtain donations of money, advertising, materials, or other services to cover its cost. Small-scale support for special projects can be solicited from local businesses, clubs, and social organizations which may want to sponsor a special project through financial contributions, services, and/or a donation of equipment or materials.

Money can be raised through special events, such as bake sales, walk-a-thons, car washes, and so forth. These events require a fair amount of organization, but they can be an excellent way to involve students, advertise the special project, raise awareness of an issue, and inject a high degree of enthusiasm.

It is important to remember to thank all those who contributed to the special project. Sending student-generated thank-you notes or inviting individuals to view special project presentations fosters goodwill between the school and the community and maintains positive, supportive connections for future projects.

Enduring Long-Term Positive Outcomes

By their very nature, special projects are likely to have a long-lasting impact on participants. However, long-term positive outcomes for special projects can and should be supported by careful record keeping and documentation, publicity and recognition, and assessment and evaluation.

Record Keeping and Documentation

Rate of project development, changes in students’ skill levels, and project costs are a few of the areas that can be monitored by keeping careful notes and records. Such documentation can facilitate publicizing and evaluating the project and can provide a resource for future projects. While teachers may want to keep their own records, older students should be encouraged to be responsible for keeping a file on their progress.

Record keeping and documentation can take the form of a journal or a daily log. Students may want to develop a portfolio for their project. This could include photographs, cost inventories, rough drafts, presentation materials, awards, evaluations, etc. Videotaping various stages of the project is another way to record project development. Whichever methods are chosen, it is important that they be realistic and accurate. The purpose of these notes is

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not to glorify anyone but to facilitate organization and evaluations, and to support the development of future projects. Mistakes or errors in judgment are good learning experiences, and those should be included as well.

Publicity

Publicity strategies can increase public awareness of a project and encourage the community to recognize students' achievements. Students' participation in a project can also be acknowledged through something more tangible like an award or an article in the newspaper.

Informing the public about special projects increases students' sense of the importance of their efforts. If the special project is designed to benefit the community, either through education or by improving environmental quality, efforts should be made to inform the community that this project is taking place. Administrators, parents, and other community members can learn about the project by being invited to participate in it or to view the final product. Publicizing the final project is important for ensuring proper recognition. Some simple publicity methods include the following:

- Designing posters or fliers
- Describing the project in parent/teacher school bulletin
- Sending out press releases to newspapers and radio or television stations
- Asking the local radio station to run a public service announcement
- Inviting the media to make the project the focus of a human interest story

Practical advice on publicizing projects can be found in most books that provide guidelines and suggestions for social action.

Recognition and Awards

When students receive recognition for their participation in a special project, this ensures that these projects will become a significant part of their lives. Many national organizations give awards for student environmental projects.

Assessment and Evaluation

Evaluating the progress of a project and of students' learning provides support and justification for the inclusion of special projects in formal education. Constructive evaluation enables teachers to show parents and administrators what students have learned or gained from participation in special projects.

If special projects will be graded as part of the class assignment, teachers should determine in advance the criteria upon which students will be evaluated. Goals, objectives, or learning outcomes for the project can be used as reference for evaluation. The quality of student participation, more than the final project, should be considered during the evaluation process. Even if students are conducting a special project outside of class, they should consider how to evaluate their progress.

There are many ways students and teachers can evaluate the success of special projects. Listed below are some suggestions.

- **Observations.** Students and teachers involved in the project know instinctively if there have been changes in knowledge, attitudes, or behavior. Aspects to consider during observations are attendance, enthusiasm, and participation. Physical developments in the project, rate of construction, professionalism of design, etc., should also be noted. Other forms of qualitative assessment such as interviews or a review of student materials can also be used to evaluate progress.
- **Student portfolios and journals.** As described above, students can keep a record of their progress. Students can also be encouraged to write self-evaluations documenting how they believe experiences with the project have affected them. Teachers can use these portfolios as a form of authentic assessment. Nonconfrontational peer

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evaluations could be incorporated into this form of assessment.

- **Pre- and post-test.** If the objectives of the project participation have been outlined and are clearly measurable, then teachers should determine if they have been achieved. Pre- and post-test can be written in the form of an essay or multiple-choice questions. Teachers should take the time to discuss the results with their students.
- **Awards and contests.** Special projects judged as part of a fair or contest may be recognized with awards.
- **Presentations.** Students can present their projects to the class, other classes, the school, or the community. An advantage of this approach is that students may educate others through their experiences.

Conclusion

Well-conducted special projects in environmental education are empowering, involving, and rewarding. These holistic growth experiences encompass multiple aspects of students' cognitive, affective, and behavioral development. With responsible planning, special projects can make learning about the environment practical and meaningful, potentially having long-term impacts on students' lives. Special projects can make significant contributions to students' environmental literacy. The aim of these active learning experiences is to inspire students to care more about the environment, so that they will become more active in preserving and protecting the planet.

Adapted from Wilke, Richard J. (Ed). (1993). *Environmental Education Teacher Resource Handbook*, Kraus International Publications. Millwood. Kraus International. Used by permission. All rights reserved.

Special Project Considerations for Teachers

- Is the special project relevant to the objectives of the class?
- How does the project fit into the curriculum?
- What are the interdisciplinary connections?
- Is the project relevant to the students' personal experiences?
- Is the project student driven?
- Will student motivation and ownership be generated by undertaking the special project?
- Do students possess the cognitive and skill levels necessary for accomplishing the project?
- Will the project include a diversity of learning techniques?
- Have the expected learner outcomes from accomplishing the project been established?
- Have the means of the student evaluation been determined?
- Are there any legal considerations or potential insurance problems?
- Will students need to leave the school grounds to complete their special project, and will parental permission be needed?
- What special arrangements will need to be made? (Transportation, special passes, parental permission, guest lectures, special facilities/space, use of special equipment such as computers or telephone, volunteers, chaperones, etc.)
- Has the time frame for the special project been outlined? (When will the students work on their special project? Will students need time outside the class?)
- Will any publicity need to be generated for the special project? If so, have the means to publicize the project been determined?
- In the case of long-term projects, who will be responsible for sustaining the project after the original participants have left?

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