

Introduction

Energy and Your School, the KEEP school building energy efficiency education supplement, provides K–12 teachers in a variety of subject areas with easy-to-use, hands-on, minds-on activities designed to promote energy literacy in Wisconsin students. The Wisconsin Department of Public Instruction's Academic Standards were referenced during the development of this supplement. See the Cross Reference Charts in the **Appendix** to learn how activities in this guide relate to different subject areas and address different approaches to utilizing a variety of teaching methods.

Grade Levels and Theme Emphasis

KEEP's *Conceptual Guide to K–12 Energy Education in Wisconsin* directed the development of *Energy and Your School*. Concepts within all the themes are relevant to teachers at any grade level and in a variety of subject areas (see **Cross Reference Charts: Grade Levels and Subject Areas** in **Appendix**). However, when building a K–12 energy efficiency education program, certain themes can be stressed at different grade levels.

Participating in activities from **Theme I: We Need Energy** provides students with a fundamental knowledge about energy. The concepts within this theme are the foundation upon which concepts in the other three themes are built. Therefore, We Need Energy should be emphasized in grades K–4. The KEEP *Energy Education Activity Guide* offers a variety of lessons and ideas for supporting student learning of Theme I energy concepts.

Activities and teaching ideas from **Theme II: Developing Energy Resources** have students identify and look at different sources of energy. These concepts are appropriate for the elementary grades, especially grades 3–5. However, other concepts within this theme require higher level thinking skills because students must interpret and examine the process of energy resource development. Therefore, many of the activities from this theme pertain to students in middle school.

Awareness of how energy use positively and negatively affects quality of life, economic activity, and the environment can begin during the primary grades; however, because of the complexity of many issues, these concepts may be better introduced at a later stage. The majority of the activities within **Theme III: Effects of Energy Resource Development** are appropriate for the middle school years. High school students can take what they have learned earlier and use the knowledge and skills to conduct special projects (See **Appendix**). Educators can teach younger students the importance of energy management. However, younger students may not comprehend the reasoning behind these efforts until they learn to think more abstractly.

The higher level thinking skills (such as linking economic activity and energy flows, linking environmental impacts and energy flows, and extrapolating how today's actions could affect the availability of energy resources tomorrow) are best suited for more mature students. Consequently, most of the activities from **Theme IV: Managing Energy Resource Use** are designed for middle and high school students. By the time students graduate from high school, they should have mastered the concepts and learned lessons from the world around them. These competencies will enable them to make wise decisions regarding energy choice, to understand the workplace and career opportunities and associated school-to-career elements, and to take actions that reflect their personal ethic and knowledge of energy.

Advice for Elementary Teachers

Elementary teachers will find many of the activities for middle school aged students can be adapted for lower grades. As explained in *Development of Energy and Your School* section, most of the supplement's activities are geared for middle and high school students because mastering energy management concepts involves higher level thinking skills. There are opportunities to engage younger students in learning about energy efficiency, however; including a K–4 supplement *Know the Flow of Energy in Your School* guide. Visit the Curriculum & Resources section of the KEEP website.

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School Building Energy Efficiency Education Online

Visit the KEEP website for more energy efficiency education. In the Curriculum & Resources section you will find the activity guides *Energy and Your School* and *Know the Flow of Energy in Your School K–4* supplement. Within *Energy and Your School* online, click on Additional Resources to find support materials, such as hands-on lending resources and worksheets, that complement the activities within *Energy and Your School* and provide ideas for extensions and special projects.

Types of Activities

There are three **Introductory Activities**, “Seeking Inhabitable Schools,” “Is Your Classroom Energy Efficient?” and “School Appliance Inventory” that you should conduct in preparation for teaching about energy in your school.

The **Activities** in *Energy and Your School* are fully developed activities that provide educators with background information, explicit objectives, a detailed procedure, and assessment strategies. They are designed to be self-contained lessons. Background information is usually found within the activity; occasionally other sections of the supplement may be referenced. Most activities require some preparation time to locate and set up materials. However, this time should decrease with successive uses. For the most part, the materials should be available in local stores or within the school. Some activities include Student Activity Sheets that are located at the end of the activity.

Integrating Energy Concepts

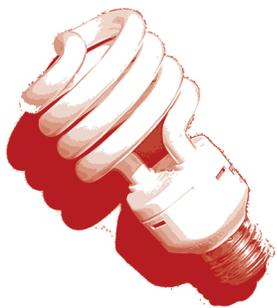
Concepts in the supplement are applicable to teachers of Science, Mathematics (Math), Social Studies (SS), English/Language Arts (ELA), Technology Education (TE), Environmental Literacy & Sustainability (ES), and Family and Consumer Education (FCE), or to anyone who wants to promote energy as part of their curriculum. Educators can use the Cross Reference Charts to identify activities relevant to a variety of their teaching needs, such as Subject Areas and Grade Levels. KEEP activities can be used to address the Academic Standards developed by the Wisconsin Department of Public Instruction. These standards identify what students should understand and how they should demonstrate achieved learning. For more information about state standards, contact the Wisconsin Department of Public Instruction: dpi.wi.gov/standards.

Assessing Student Learning

Energy and Your School provides several approaches for assessing student learning. It is helpful to assess students’ current understandings of energy consumption. Use the introductory activity “Is Your Classroom Energy Efficient?” on the following pages to gain insight into what students currently think about energy used in schools. Furthermore, the **Orientation** of each activity procedure provides suggestions for ascertaining what students know about the upcoming lesson. **Formative** and **Summative Assessment** ideas are located within each activity. The **Formative Assessment** points out events during the activity when educators can check their students’ achievement of the objectives. **Summative Assessment** takes place near the end of the activity or after the activity’s completion. The aim of **Summative Assessment** is to determine if students can take what they have learned and apply it to a different experience.

Special Projects

Energy and Your School not only provides linkages to curriculum and classroom resources, but is designed to help K–12 school communities investigate and document building energy use and energy management policies, and contribute to increased energy efficiency and savings. See the **Special Projects in Energy Management for Schools** section in the **Appendix** and visit KEEP’s website for links to state and federal energy management policies, incentives and funding, as well as resources for engaging students and teachers in school building energy audits, whole school sustainability initiatives, development of school energy policy, and creation of school energy committees. KEEP offers school building energy efficiency education workshops and in-services for school communities. Visit the Professional Development section of the KEEP website to learn more.



Activity Format

Summary: Briefly describes student learning and activity procedures

Grade Level:

Suggested grade levels: K–4, 5–8, 9–12 (those found in parentheses indicate the possibility of adapting the activity for those grade levels)

Subject Areas:

Relevant subject areas.

Setting:

Recommended location.

Time:

Preparation: Approximate time needed to review background information and set up materials.

Activity: Average class time needed to conduct the activity.

Vocabulary:

Key terms introduced or used in the activity.

Major Concept Areas:

Lists the major energy concepts covered in this activity.

Getting Ready:

Directions for preparing materials or setting up demonstrations prior to conducting the activity with students.

Related KEEP Activities:

Theme activities that can precede, supplement, or follow this activity.

Objectives

Knowledge and skills students will acquire as a result of doing the activity.

Rationale

Importance of students learning the concepts or skills in this activity.

Materials

Items needed for the activity. Any necessary preparation of materials is described in **Getting Ready**.

Student Activity Sheets are noted in bold, red italics.

Background

Description of energy topics and concepts addressed in the **Procedure**.

Procedure

Orientation

Discussion topics that can be used to relate forthcoming concepts to students' lives and to assess what students currently know about the concepts in the activity.

Steps

Suggested strategy for completing the activity. Written instructions and materials for students are found on separate ***Student Activity Sheets*** directly following the activity.

Closure

Discussion topics that can be used to conclude the activity and to assess what students have gained from participating in the activity.

Assessment

Formative

Questions about student actions that occurred during the activity.

Summative

Suggested activities that have students applying learned information or skills to new situations.

Extensions

Variations and additions to the activity.

Standards Addressed

Access the KEEP website to find a table listing some of the standards that are addressed by the activity including Wisconsin's Academic Standards, Common Core State Standards, and Next Generation Science Standards.

Excerpt from
Energy & Your School Activity Guide
at keepprogram.org

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The Wisconsin K-12 Energy Education Program is supported through funding from



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College of Natural Resources
University of Wisconsin - Stevens Point

