

School Energy Consumption Survey

Overview

In this activity, students investigate the management of the energy consumed in their school. They measure and monitor the temperature and light intensity levels in classrooms, hallways, and other rooms; the temperature of the hot water in different areas of the school, and other controls, management, and behaviors that affect energy consumption.

LEVEL

Grades 7–12

SUBJECT

ENERGY CONSUMPTION:
Investigating the school's energy consumption profile.

CONCEPTS

- Schools can significantly reduce energy costs by using energy efficient technologies and monitoring and controlling energy consumption.

SKILLS

- Investigation & Research
- Record Keeping
- Data Analysis
- Critical Thinking
- Presentation

OBJECTIVE

To conduct a survey of the school's energy consumption.

MATERIALS

- Light Meter
- Thermometer
- Measuring Tape
- Hygrometer

TIME

Two class periods plus on-going monitoring as desired.

Background

Even if school buildings are well insulated and have the most modern, efficient energy systems, a significant amount of energy can be wasted if these systems are not controlled and managed wisely.

The best heating system in the world cannot operate efficiently if outside doors or windows are left open, or if the temperature is not controlled. The same is true for cooling systems. Temperature control systems should be set at 68°F during the heating season and 78°F during the cooling season during the day, and at 55°F (heating) and 85°F (cooling) during the night for optimum efficiency.

Programmable thermostats with access limited to authorized personnel are recommended. There should also be policies regarding opening windows and doors when systems are operating.

If the temperature of rooms can be individually controlled, there should be policies on permissible temperature ranges. These ranges can vary for different rooms—gyms, for example, need not be heated to the same temperature as classrooms, when physical activity is scheduled. Auditoriums, hallways, storage rooms, and other little used rooms need not be heated and cooled to the same temperature as occupied rooms.

Lighting—even the most efficient fluorescent system—is not efficient if it is used indiscriminately. In most schools, more light is used than is necessary. Maximum use of natural lighting should be encouraged and dimmer switches should be used where available. All lights not necessary for safety should be turned off when rooms are not in use. The same is true for outside lights.

Water heaters should be equipped with timers and temperature settings regulated according to task. Washing hands does not require water as hot as washing dishes. Most water heaters are set much higher than necessary for the task.

Doing the Activity

Step One

GO TO PAGES 20–22 OF THE STUDENT GUIDE and introduce the activity. If the school system has an Energy Manager, arrange for a presentation to introduce the activity.

Demonstrate how to operate the thermometer, hygrometer, light meter, and tape measure. **GO TO PAGES 24–26 OF THE STUDENT GUIDE** for detailed explanations of the light meter and hygrometer, and recommended light levels.

Using the blueprint of the school created earlier, number the common areas and non-class rooms of the school as a class.

Step Two

Divide the class into six groups, assigning each group two classrooms, one common area, and one non-class room to investigate. Choose areas from each side of the building, upstairs and downstairs, to get a wide sampling. To expand the activity, investigate all of the rooms, or have different classes record data of rooms at different times of the day.

Allow each group 10–15 minutes to collect the data on the recording form. While one group is collecting data, have the other students discuss and devise different methods of analyzing the data collected—for example, comparing rooms on the South side with rooms on the North side.

Step Three

Analyze the results using the methods the students devised.

Discuss the findings and brainstorm ways to conserve energy. Draw up a list of recommendations for improving energy savings.

Step Four

Evaluate performance using data collection and participation in the development of the analysis methods and list of recommendations.