

Chapter 8 Lesson Plan

Energy & Power Fundamentals

Chapter Resources		
Textbook Activity	Teacher CD	Online Learning Center
Measure Energy and Power Design an experiment utilizing energy and/or power measurements.	Lesson Plan Flash® Presentation ExamView® Chapter Test	Chapter Activities Chapter Quizzes

FOCUS

Chapter 8 reviews the types and forms of energy and power. A broader discussion of controlling power and the impacts of power and energy is included.

Objectives

- Identify the forms of energy and power.
- Explain why energy must be controlled.
- List impacts of energy and power technology.
- Explain how to measure different forms of energy and power.

Tying to Previous Knowledge

Ask the class how any particular machine or process is powered, either currently or in years past. Point out that although the technology has certainly evolved, the need to produce, control, and apply the energy has really remained the same.

TEACH

1. **Demonstration.** Illustrate or demonstrate how water evaporated from a reservoir can be condensed into water on a lid above it. Explain how the water did not simply disappear but rather was changed into another form and then back again. Note that this is similar to the Law of Conservation of Energy.
2. **Inquiry.** List a number of technology systems and ask the students what is powering them. See if anyone can name a technology system that does not require power. (There really are not any.)
3. **Analysis.** Fill two cups with equal amounts of water and hold them at different heights. Ask the class to decide which has more potential energy. Next challenge the class to design an experiment that will prove their thinking is (or is not) correct.
4. **Demonstration.** Have three student volunteers demonstrate how to prove that one of them is exerting more force than the others are exerting. (Note that force is a push or pull on an object.)

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Energy & Power Fundamentals (continued)

ASSESS

Have students complete Chapter Test 8. Chapter tests are found in the *ExamView*® Assessment Suite on this Teacher Resource CD-ROM.

Reteach

1. Ask the class if an ordinary kite can do work. (Can we get the wind to work for us; perhaps in lifting something?)
2. Project images or display pictures of various types of energy and ask the students to indicate whether each one would be categorized as potential or kinetic. Ask them to explain their reasoning.

Enrich

1. The energy of water falling from a large elevated tank can be utilized, but it also takes energy to pump the tank full again. How can one determine whether there is a net energy gain? (Remember that no pump is 100 percent efficient.)
2. Discuss whether an incandescent bulb is giving off heat or radiant energy. (The correct answer is both. Incandescent bulbs, however, are considered inefficient because their purpose is to provide light, not to generate heat. The heat is actually indicative of inefficiency.)

REFLECT

Note that automobiles typically gain their greatest efficiency (as measured in miles per gallon, or *mpg*) at about 35–40 mph. Ask the class to analyze why cars going faster will ordinarily get poorer gas economy. (The single most power-consuming factor is the increased wind resistance at higher speeds. The engine itself remains fairly constant with respect to efficiency.)