Class Starters & Enders

Making the Most of Instructional Time
Five Minute Lessons

Class Starters and Enders help utilize the last minutes of class when a lesson ends but there is not enough time to start another, or for an interest approach at the beginning of class. Mini-lessons correlate to GPS in the programs areas below.

Powerful Winds Powering Homes

Program Areas: Engineering & Technology, Agriculture

Instructions: Read the material and make notes of important points, answer questions, and be ready to discuss this topic.

Power can be defined in many ways – it is energy, force, and momentum. There are different types of power, including mechanical, hydroelectric, and optics. Typically power comes from sources such as bodies of water, magnets, and solar panels, with new sources of power constantly being developed.

Wind power, for example, is the conversion of wind energy into a useful form of energy. Wind power has been around for centuries, but is being revamped to provide power for an ever-changing world. Hefty breezes are utilized by **wind turbines** to make electricity, **wind mills** to create mechanical power, or **wind pumps** to pump or drain water.

Seamen used wind power for at least 5,500 years to **propel** sailboats and sailing ships, and architects have used wind-driven natural ventilation in buildings since similarly ancient times. Windmills have been used for **irrigation** pumping and for **milling** grain since the 7th century AD in what are now Afghanistan, Iran and Pakistan.

In the United States, the development of the "water-pumping windmill" was the major factor in allowing the farming and ranching of vast areas otherwise devoid of readily accessible water.

Wind pumps contributed to the expansion of rail transport systems throughout the world by pumping water from water wells for steam locomotives. The multi-blade wind turbine atop a lattice tower made of wood or steel was for many years a fixture of the landscape throughout rural America. When fitted with generators and battery banks, small wind machines provided electricity to isolated farms.

Wind energy is seen as a positive alternative to fossil fuels.

Wind energy, as an **alternative** to **fossil fuels**, is plentiful, renewable, widely distributed, clean, and produces no greenhouse gas emissions during operation. Harnessing wind power has many positives, but there are still some problems yet to be resolved about the technology. The construction of wind farms is not universally welcomed because of their visual impact and other effects on the environment. People living near wind turbines often complain of the constant noise, the "**strobe effect**" of the blades' shadows, and poor television reception.

Most forms of energy production create some form of negative **externalities**. For electric production, the most significant externality is pollution, which imposes increased health expenses, reduced agricultural productivity, and other problems. In addition, carbon dioxide may impose even greater costs in the form of global warming. Few mechanisms currently exist to internalize these costs, and the total cost is highly uncertain.

Review

1. How long have people used wind power?
2. A wind turbine is used to generate _____.
3. Name three uses for wind power.
4. Why is wind power beneficial for agriculture?
5. Why is wind power better for the environment?
6. Do most people welcome the look of wind farms in their communities?
7. List three common complaints about wind farms.

Language Connection

Define the following terms.

Alternative	Propel
Externalities	Strobe Effect
Fossil Fuels	Wind Mills
Irrigation	Wind Power
Milling	Wind Pumps
Power	Wind Turbines

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