Use this in concurrent with Texas Unit NO. 4: Renewable Energy for the Home

California Curriculum:

**Grade Four**

Physical Sciences

1. Electricity and magnetism are related effects that have many useful applications in everyday life.
   a. Students know how to design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs.
   b. Students know electrical energy can be converted to heat, light, and motion.
   c. Investigation and Experimentation

2. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations.
   a. Differentiate observation from inference (interpretation) and know scientists’ explanations come partly from what they observe and partly from how they interpret their observations.
   b. Formulate and justify predictions based on cause-and-effect relationships.
   c. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.
   d. Construct and interpret graphs from measurements.
   e. Follow a set of written instructions for a scientific investigation.

**Grade Five**

Earth Sciences

1. Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns
   a. Students know the causes and effects of different types of severe weather
   b. Students know how to use weather maps and data to predict local weather and know that weather forecasts depend on many variables
   c. Investigation and Experimentation

2. Scientific Process is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, student should develop their own questions and perform investigations
   a. Develop a testable question
   b. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
   c. Select appropriate tools (e.g. thermometers, meter sticks...) and make quantitative results
   d. Record data by using appropriate graphic representations and make inferences based on those data
   e. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion
   f. Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions
Required Materials:

Use the Vernier labquest with temperature sensors instead of thermometers.

To use: First remember to check if the labquest is charged. Simply plug in the temperature sensor. Wait until the screen shows a temperature reading before recording temperature. For this lab you will only be collecting real-time data. There will be no data collection over a time period.

Page 3 Group Reading Section Questions to change:

Group 4: How are windmills used in Texas California?

Group 5: How is wind energy collected? What are 2-3 places in Texas California that are good for wind turbines?

Reading Passage:

Page 9 Wind Turbines

Wind is a powerful source of energy. The power of wind can be seen in a hurricane or tornado. Wind energy can be collected with wind turbines. Wind turbines change the wind into electricity. Areas like Altamont Pass (east of San Francisco), Tehachapi (south east of Bakersfield) and San Gorgonio (near Palm Springs, east of Los Angeles) are very windy. Windy areas like this are good places to have wind turbines. These are the three main areas where wind turbines are today.

Source: http://www.energy.ca.gov/wind/overview.html

Page 10 Windmills

California is known for its many attractions; beaches, mountains, deserts and cities. But not a lot of people know California also have windmills. These windmills can be seen throughout the state. Some are a part of history and others serve practical functions like pumping water and providing electricity.

Source: http://www.ehow.com/list_6592119_famous-windmills-california.html

Should you have questions about this activity or suggestions for improvement, please contact Professor Jan Kleissl at jkleissl@ucsd.edu.