Lesson Title: Wind Energy	
Grade Level: 8th	Subject Area: Physical Science
Alexandria Suchy-Mabrouk, Depoali Middle School	Lesson Length: two weeks

The Teaching Process

Lesson Overview- Students will understand how wind energy is used in the United States and then they will have to build their own wind turbine.

Unit Objectives: Students will understand how the wind can help eliminate our dependency on oil and what some limitations of wind energy are in the United States.

Standards addressed The following are Next Generation Science standards that are addressed in this unit: MS PS3-a, MS ESS3-d, MS-ESS3-E, MS PS3-g

List of Materials

1) **Copies of the article for students to read**
2) **Computers with internet access**
3) **Materials listed in wind turbine lab**

Instructional Sequence

Phase One: Engage the Learner

Students will do a close read of an article from the New York Times. (http://topics.nytimes.com/top/news/business/energy-environment/wind-power/index.html) First read the article out loud as a class. Then have students write down any words or questions they have on sticky notes. Have students post these sticky notes somewhere in the classroom. Look at these after class to determine what kinds of questions they have and create an activity for students to answer some of the questions. The next day read the article again. Have students answer the following questions:
What are the consequences (good and bad) if we stop using wind as an energy source? (Support this with lines from the text)
What are the consequences (good and bad) if we continue using wind as an energy source? (Support this with lines from the text)

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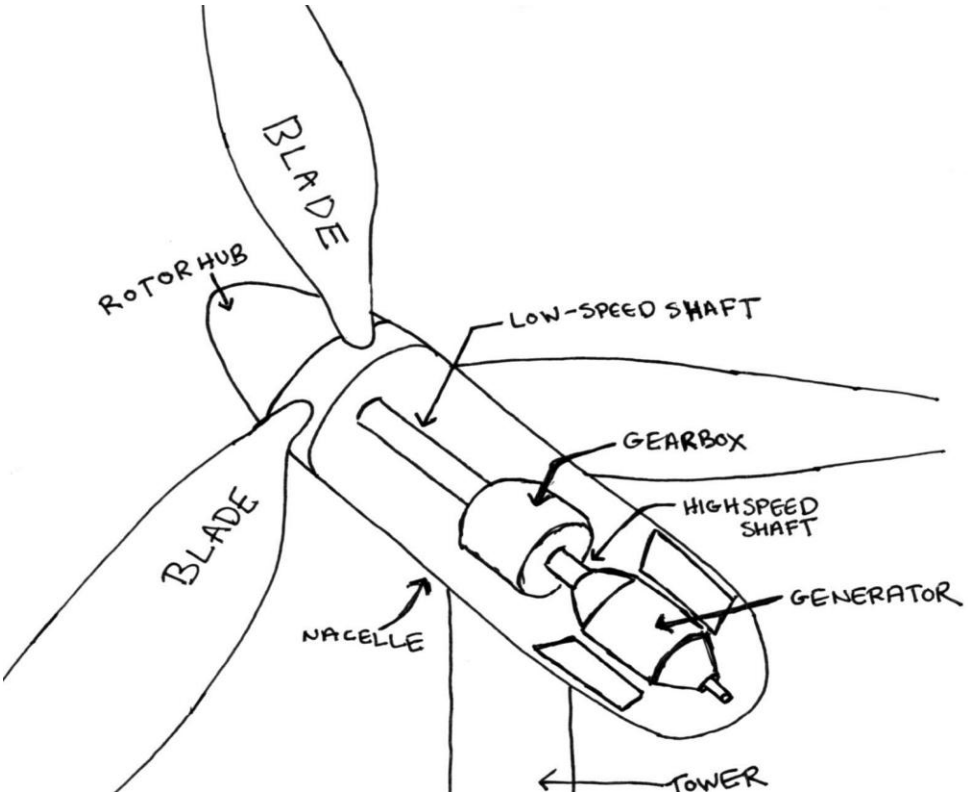
Phase Two: Explore the Concept

Students will be given an area of the USA and asked to research wind energy in that area. They will find out "how much wind is produced in that region?", "what are the benefits of having wind energy in that area?" and "what are some problems facing wind energy in that region?".
Example for Nevada : https://www.nvenergy.com/renewablesenvironment/renewables/wind.cfm
Students will present their findings to the class.



Phase Three: Explain the Concept and Define Terms

Lecture covering topics including but not limited to: convection currents, kinetic energy, the history of wind power, velocity, potential energy, wind, wind turbines, and work. Students will have guided notes that they will fill in.

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Phase Four: Elaborate the Concept
Students will build a wind turbine as outlined in a lesson plan posted at http://www.infinitepower.org/pdf/No8%2096-818B.pdf. Students will build the turbine and complete the lab that is attached to the PDF.

Phase Five: Evaluate students' Understanding of Concept
Student will write a formal lab report. They will be told they now need to make a turbine that will work when wind speeds vary. They will take the wind turbine made in the previous section and modify to work under conditions where the wind varies. They will write up their findings in a lab report and share then with the class.

Please share your comments about successes with this method with Alexandria Suchy-Mabrouk, c/o Depoali Middle School, 9300 Wilbur May Parkway, Reno, Nevada 89521, 775-852-6700 or by e-mail: Alexandria Suchy-Mabrouk asuchymabrouk@washoeschools.net

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