

Home Activity - Wind Power

This is an **at-home family independent activity with adult assistance**

GRADE LEVEL: 4

PROGRAM AREA: Power Generation

OVERVIEW

Students make a pinwheel, explore how it turns with a fan, running outside with it or blowing on it. They review photos of wind turbines and view a diagram showing how wind turbines produce electricity. They discuss why it is a renewable source of energy. Finally, they determine the advantages and disadvantages of wind power.



KEY CONCEPTS

Wind can turn a turbine which turns a rotor to produce electricity. It is a renewable source of energy. Like all forms of power there are both advantages and disadvantages to wind power.

STEWARDSHIP MESSAGE

Renewable energy sources like wind power provide needed electricity without depleting natural resources. Wind energy also does not pollute the air.

MATERIALS LIST

- 6" X 6" Square piece of paper, push pin, ruler, pencil with eraser attached, scissors, electric fan (with adult assistance)
- Video for directions - *The Crafty Mom*

tiny.cc/1syusz

- Photos and diagram of wind turbines (Also included at end)
http://wiki.evolvs.org/images/9/98/Wind_Power_Photos.pdf

- Brief description for the wind turbine diagram: Wind blowing the rotor blades makes them turn. That causes the drive shaft to turn in the generator. Then the electric generator turns the power into electricity.
- Advantages and disadvantages cards - cut out prior to lesson and mix up. (At end)
- Graph of renewable power sources in California
http://wiki.evol.org/images/f/f8/CA_Wind_Power_Map.pdf

PREPARATION

- Parents may wish to help with gathering materials.
- Parents may wish to supervise student use of a fan.

LESSON STEPS

1. For the independent activity, students watch the 3-minute YouTube video clip showing how to make a pinwheel.

<https://www.youtube.com/watch?v=4ox88B8yjWQ>

2. They assemble their pinwheel and test it by blowing on it, running outside with it and placing it in front of a fan.

3. Students explore ways to make the pinwheel move faster and slower. They write down what they discover.

4. Students view the photographs of wind turbines. Students review the diagram and read the brief explanation (in materials list) of how wind turbines produce electricity.

5. Students read each advantage and disadvantage card placing each into a column for advantages or one for disadvantages of wind power. Discussion with an adult at home features the reasons for the advantages and disadvantages. (Later students can photograph their chart to email their teacher for accountability.)

6. Students with an adult study the graph of renewable power sources and their use over a number of years. Discussion may include the rising usage of solar and wind power in recent years plus the decline of hydropower. Students can debate the reasons. Students are asked if wind power is a renewable or non-renewable resource.

Tips - An adult should assist with the fan to be sure the student is safe using it.

Questions to Ask Students

- What did you discover about making your pinwheel go faster or slower?
- What are you curious about as you think about wind power?

WRAP UP

- Would you use wind power as the only source of electricity for your city? Why?

Children will clean up and put all of their materials away.

EXTENSIONS

Students could look up the weather each day to find out about the wind and track it for a week on a homemade weather calendar. Then they could answer this question: If we only had wind power as a way to generate electricity how many days might we have had power to use this week?

More Advantage and Disadvantage Cards

If time permits and the student wishes to carry on this discussion at home, other advantage and disadvantage statements are below.

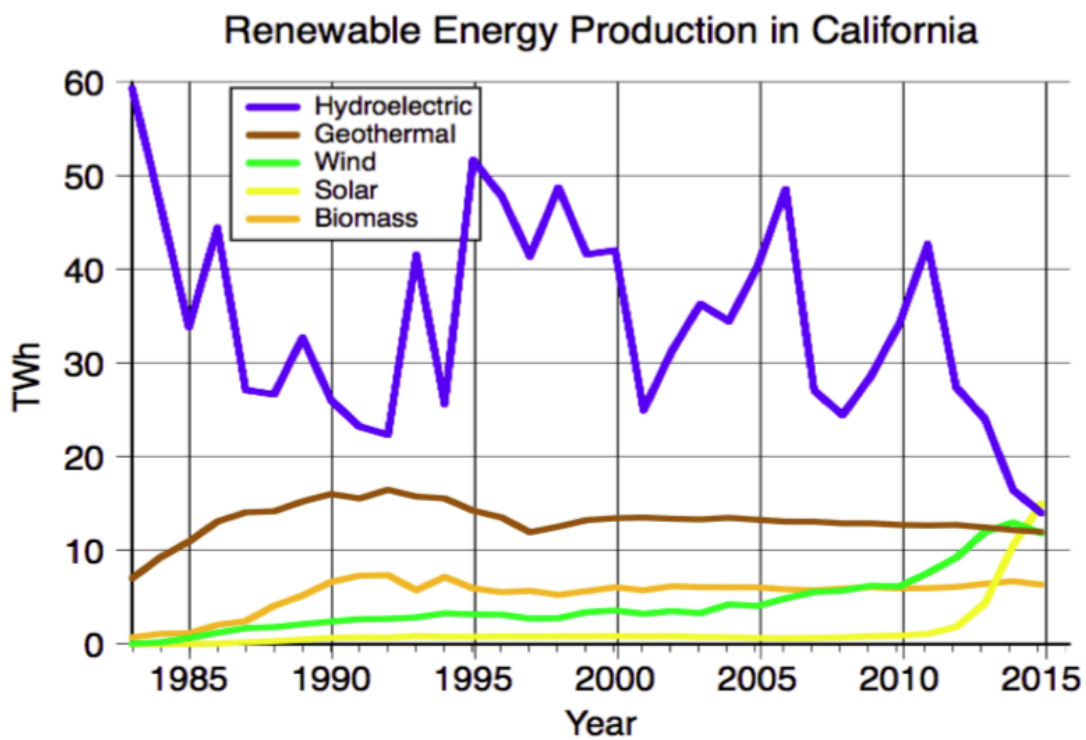
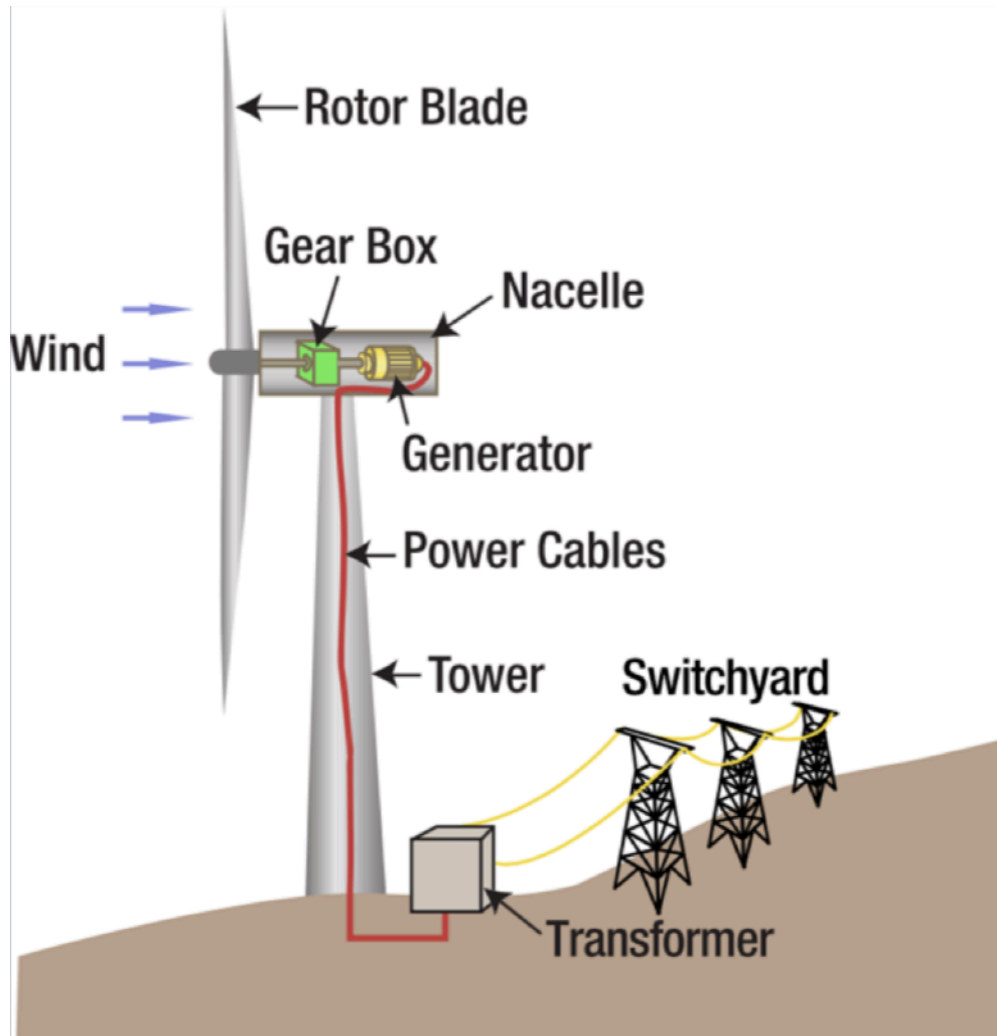
1. Wind farms can be expensive to build (manufacturing and installation costs).
2. Wind farms are quite inexpensive to run after they have been built.
3. Good wind sites are often located in remote locations, far from cities where large amounts of electricity is needed.
4. Wind farms can be built on farms or ranches and farming and ranching can continue.
5. Turbines can cause noise pollution and can look unattractive.
6. Wind power storage is still in development.
7. It can be unsafe to build and maintain wind farms.
8. Wind turbines are available in a range of sizes which means a vast range of people can use them (single households, small towns, etc.)

MATERIALS For ACTIVITY

Four Photos and Advantage/Disadvantage Cards







Advantages and Disadvantages cards to cut out and mix up:

1. Wind farms produce different amounts of electricity depending on the speed of the wind. Sometimes that means they produce no electricity at all.	2. Generating electricity with wind does not create any pollution.
3. Turbine blades can damage local wildlife, especially birds.	4. Wind is a renewable resource, it will not run out like fossil fuels and reduces fossil fuel consumption.
5. Only certain areas, like coastlines and hillsides, have enough wind to produce electricity.	6. People living in remote areas can use wind turbines to generate energy for themselves.

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<https://www.evols.org/donate/>

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