Wind Energy: I’m a Big Fan Outline

**Lesson Objectives:**

* Students will learn about wind energy which is a source of renewable energy.
* Students will learn about wind turbines and how they work.

**Materials:**

* Construction Paper
* Scissors
* Push Pins
* Pencils

**Introduction of Activity:**

1. Renewable energy is energy which comes from natural resources such as sunlight, rain, tides, and geothermal heat, which will not be depleted.
	1. Renewable energy is the best type of energy as it does not harm our planet.
2. Non-renewable energy is energy which cannot be produced, grown, generated, or used on a scale which can sustain itself.
	1. Examples of non-renewable energy include oil and natural gas. Once we use of up all of the non-renewable resources on the planet, they will be gone for good.
3. Wind energy is a great example of renewable energy as it is a natural resource that will always be in existence on earth.
4. A wind turbine is a device that converts [kinetic energy](http://en.wikipedia.org/wiki/Kinetic_energy) from the wind, also called [wind energy](http://en.wikipedia.org/wiki/Wind_energy), into [mechanical energy](http://en.wikipedia.org/wiki/Mechanical_energy) in a process known as [wind power](http://en.wikipedia.org/wiki/Wind_power).
	1. If the mechanical energy is used to produce electricity, the device may be called a wind turbine or wind power plant.
	2. If the mechanical energy is used to drive machinery, such as for grinding grain or pumping water, the device is called a [windmill](http://en.wikipedia.org/wiki/Windmill) or [wind pump](http://en.wikipedia.org/wiki/Wind_pump).
	3. Similarly, it may be referred to as a wind charger when used for charging batteries.
5. The most common type of wind turbine is a horizontal wind turbine, which is a turbine with three large blades. The wind turbine at Lafayette College’s Metzgar Field is an example of a vertical wind turbine.
6. Wind farms are built on flat, open areas. Wind farms can be either on-shore or off-shore.
7. Fun Facts
	1. Wind power is currently the fastest growing source of electricity production in the world.
	2. A single wind turbine can power up to 500 homes.
	3. There is enough on-shore wind in America to power the country 10 times over. So why not use wind turbines if they are more sustainable?
		1. Wind turbines take up more land than other forms of energy, and it is not a consistent form of energy. Wind turbines will only produce energy, when there is wind.

**Demonstration with Paper Wind Turbines:**

1. Using the materials provided, have the students experiment with the three different types of wind turbines, as depicted on the Wind Turbine: I’m a Big Fan worksheet.
	1. Which turbine is the fastest? Does it correlate to the number of blades?

**Follow Up Questions:**

1. What is wind energy and where does it come from?
2. What time of energy is wind energy? Renewable or non-renewable?
3. What are the advantages and disadvantages of wind energy?
	1. One advantage is that wind energy is a form of renewable energy. Wind energy also does not harm our environment.
	2. One disadvantage is that wind turbines only work when there is wind. Wind turbines also require a large amount of land.