



## Summary

The students will use data from a wind turbine to gain an understanding of how much electricity we actually use every day.

## Goals

Graph the average watts produce each hour of one given day from a wind turbine. Graph items typically used on a daily bases using the same x and y axis. Compare the two graphs to determine how our habits might need to change if we had to use only the turbine for power.

## Facilitation

1. Observe the current generation from your wind turbine (or one of NPPD's turbines at [www.nppd.com/kiosk](http://www.nppd.com/kiosk)).
2. Discuss the items on the Watts list that could be powered at that time by the turbine.
3. Provide students with data from one day of production from the turbine.
4. Have the students make a graph with the average watts produced over each hour of the day selected (do not accumulate the watts – average them).
5. Have the students make a list of all the electrical items that they would use for each hour. Total the watts necessary to power the items.
6. Graph the watts list using the same X and Y axis (watts and hours).
7. Students will then have to determine how to manipulate the list so that each hour of usage is less than or equal to the hour of generation.
8. Extend the activity by observing a sample electric bill and discussing real life applications to this graphing activity. Challenge students to write up a scenario where they save 10% of their electric bill.

## Time

1 class period

## Toolbox

Data from wind turbine

Watts list of typical electric appliances.

Graphing paper or spreadsheet

## Tips

Spend time discussing the current power and what could be operated at that time. Ask questions like: How many of the lights in the classroom would light up with the power from the turbine? (check the bulbs for the watts they use and then calculate!)

To challenge the students add in the kilowatt hour factor. They will then have to calculate how long they use each item during that hour! Don't forget to then accumulate the kilowatts generated for each hour (that will give you a kW/h factor instead of an average).



## Background Resources

A sample electric bill:

<http://www.nppd.com/my-account/how-to-read-my-bill/>

## Performance Checklist

1. Student can accurately graph data from turbine.
2. Student creates a realistic list of items used on a daily basis.
3. Student identifies gaps between production and usage when comparing two graphs.
4. Student can alter list of items used to better match the production graph.
5. Student can read an electric bill and draw conclusions on their electrical habits based on the graphing exercise.

