

# KidWind Professional Development Workshop – St. Thomas Energy Efficiency and Renewable Energy in the Classroom

## DRAFT

### [DAY 1]

8:00 – 9:15 Check-in, Coffee, Pre-Workshop Evaluations, Agenda, Intros

### UNDERSTANDING ENERGY, ELECTRICITY & EFFICIENCY

- 9:15 – 9:45    **ACTIVITY**    *Understanding Forms and Sources of Energy (WindWise Lessons 1)*  
We will explore forms of energy, sources of energy, and energy transformations through activities, demonstrations and discussion.
- 9:45 – 10:15    **LECTURE**    *Energy Basics (WindWise Lesson 2)*  
Sources of energy, conservation & efficiency, phantom loads, etc.
- 10:15 – 10:30    **BREAK**
- 10:30 – 11:30    **ACTIVITY**    *How Does a Generator Work? (WindWise Lesson 9)*  
In this activity we will explore Faraday's law, building simple electric generators. We will explore how design variables affect electricity production and try to light a small light bulb.
- 11:30 – 12:15    **ACTIVITY**    *What is the Cost of Inefficiency? (WindWise Lesson 3)*  
We will learn about work, energy, and power and explore how using electrical appliances and devices can have economic and environmental costs. We will use Kill-a-watt meters to measure and compare various devices.
- 12:15 – 1:00    **LUNCH BREAK**

### UNDERSTANDING & EXPERIMENTING WITH WIND POWER

- 1:00 – 2:00    **ACTIVITY**    *Constructing Electrical & Weightlifting Wind Turbines*  
Teachers will construct simple classroom wind turbines. During this process we cover topics related to electromagnetism, energy transformations and kinetic and potential energy.
- 2:00 – 3:00    **LECTURE**    Wind Energy Basics – History, Technology, Impacts, and Classroom applications
- 3:30 – 5:00    **ACTIVITY**    *Designing Wind Turbine Blades*  
Using the turbines they have recently constructed teachers will explore the science of wind turbine blade design

**These activities use WindWise Lessons 8,10,11**

**[DAY 2]**

**8:00 – 9:00 REVIEW, AGENDA, QUESTIONS**

**UNDERSTANDING & EXPERIMENTING WITH SOLAR THERMAL & PV**

9:00 – 10:00 **LECTURE** Solar Power Basics – Solar Thermal and Photovoltaics

10:00 – 11:00 **ACTIVITY** *Solar Thermal Experiments*  
Teachers will build solar collectors and measure temperature change in water

11:00 – 12:00 **ACTIVITY** *Photovoltaic Experiments*  
Teachers will perform experiments with small solar panels, such as: Sun angle experiments, wiring different types of circuits (series vs. parallel), powering load devices (motors, lights, water pumps), and building solar powered cars.

12:00 – 1 **LUNCH**

1:00 – 2:00 **DISCUSSION** *Can Renewable Energy Power Our Classroom?*  
Teachers will conduct an energy audit of the classroom to find out how much power is used. This is an important bridge as the teacher move to their offsite tours in the afternoon.

2:00 – 5:00 **OFFSITE TOUR/GUEST LECTURES**

**EACH TEACHER THAT PARTICIPATES WILL RECEIVE THE FOLLOWING EQUIPMENT**

**Electricity & Energy Efficiency Materials**

L3007 (1) Kill A Watt Power Monitor US version

A0051 (1) simpleGEN Kit

**Wind Materials**

A0020 (1) Basic Wind Experiment Kit - Classroom Pack

**Solar Materials**

C0024 (1) Sun Angle Science Kit

L1023 (1) Teaching Solar

C0020 (1) Solar Thermal Exploration Kit

(1) Curricular Print Materials