# Energy Explorations Outline

Station 2

# Watts Up? Station

**Materials:**

Kill-A-Watt Meter Fan

Hair dryer IL Christmas Light Strand

Bulb holders or lamps LED Christmas Light Strand

Incandescent light bulb CFL light bulb

Radio LED light bulb

**Introduction to Watts Up:**

* What is electricity and how do we measure it?
* Electrical energy is the flow of electrons. Electrical power is the rate at which electricity is transferred or used. To measure electric power we use watts.
* A kilowatt is 1,000 watts. It is used to measure larger amounts of electricity.
* Kilowatt-hours measure the electricity, or energy, that we use. Measuring electricity is confusing because we cannot see it. We use electricity to perform many tasks.
* A kilowatt-hour measures the amount of electricity used in one hour. We pay for the electricity we use in kilowatt-hours. Our power company sends us a bill for the number of kilowatt-hours we use every month.
* Does anyone know the abbreviation for kilowatt-hour? kWh Most residential customers in Ohio pay an average of eleven cents per kWh
* Why is it important to know how many watts an appliance uses?

The electric company charges us by the kilowatt-hours (1,000 watts) x hours.

* It is not just the power an appliance uses but time is also an important factor. The more kilowatts we use and the more time we use them, the more our electric bill will be.

**Activity:**

* Predict how you think the appliances will rank in their energy use, which will be measured in watts, with one being the lowest watts and six being the most watts. ***Allow discussion as a group.***
* Measure-Plug the appliances one at a time into the watt meter.

*Note to Leaders: When measuring the radio, take three measures:*

* Plugged in with light only (no radio)
* Radio at a low volume
* Radio at max volume
* What differences did you see? Why?
* Do the same with the hair dryer on the low and high settings.

* Record-Have the students record the watt reading on the chart on their student worksheet. Repeat until each student has had an opportunity to take a reading from the watt meter and all appliances have been recorded.
* Process
  + Did anyone get them all right? Were any of the appliances a surprise?
  + Remember that any time you change the temperature of something; more energy is required (hair dryer requires more energy than the fan.) When heat is produced, more energy is consumed (the incandescent light bulb uses more energy than the compact fluorescent light bulb (CFL) or light emitting diode (LED).
  + What about the two strands of Christmas lights (IL vs. LED)? ***Possibly discuss how many strands of lights might be used by a typical home and how the savings could be multiplied…***
  + What is one change you can make at home to save more energy?

**Answers to questions in student booklets:**

|  |  |  |  |
| --- | --- | --- | --- |
| **APPLIANCE** | **PREDICTED RANK**  **#1=Lowest Watts #8=Highest Watts** | **WATT-METER READING**  **(watts)** | **ACTUAL RANK**  **#1=Lowest Watts #8=Highest Watts** |
| **Incandescent**  **Light Bulb** |  |  |  |
| **Hairdryer** |  |  |  |
| **LED Christmas**  **Lights** |  |  |  |
| **CFL Light Bulb** |  |  |  |
| **Radio (low volume)** |  |  |  |
| **Incandescent**  **Christmas Lights** |  |  |  |
| **LED Light Bulb** |  |  |  |
| **Fan** |  |  |  |