



# Watts Up

## Plugging in to Electricity and Conservation

Bar-T's **WATTS UP** lesson is an engaging exploration of electricity and conservation that brings hands-on learning stations into your classroom. Students will learn what current sources generate Maryland's electricity, why renewable resources are good for our environment and why it's important to make sure we turn off the lights when we leave the classroom!

**WATTS UP** hands-on learning stations are provided by our Bar-T environmental educators and include:

-  **Wind Power** – Our model wind turbine provides a classroom-sized demonstration of wind's power potential.
-  **People Power** – Students provide the muscle for our human-powered generators and experience how motion is used in combination with magnets and copper wire to generate electricity.
-  **Water Power** – Hydroelectricity currently produces more renewable energy than any other source in the USA. Our model introduces students to how we convert the energy from our lakes and rivers into electricity.

In addition to supporting students' understanding of STEM and Environmental Literacy Standards, this lesson also integrates the following Next Gen objectives and curriculum standards:

- Natural and man-made objects in the environment.
- Human actions that affect and/or harm the environment.
- Recognize that caring for the environment is an important human activity.
- Introduction to uses of electricity and introduction to conservation and protection of natural resources.

**Objective:** Students develop a basic understanding of energy, electricity, and strategies to conserve both. They are presented with the current issues of non-renewable energy verses renewable energy and challenged to weigh the pros and cons.

The cost for this lesson is \$10.00 per student

Contact us to learn more about: **Watts Up** Shannon  
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## A few screenshots of our Watts Up Flipchart:

**What is Electricity?**  
Electricity is a form of energy.

**Where does it come from?**  
Power Plants convert other forms of energy into electricity.

We use Power Lines to get electricity from the Power Plants to where we need it.

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*We discuss what electricity is, where it comes from, and have students identify what types of things use electricity and what types do not.*

**How does it work?**  
Michael Faraday discovered that when we combine magnets, wire and motion we get electricity.

Michael Faraday (1791-1867)

$C + \text{coil} + \text{rotation} = \text{lightbulb}$

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*We have several interactive models that the students will use to explore Faraday's Law further.*

**Did you know ...**

- Not all things use the same amount of electricity.
- The amount of electricity used is measured in Watts.

**Let's explore Watts!**

What do you think will use the most electricity?  
What do you think will use the least electricity?

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*We present each of these items to the class, have the students collaborate and hypothesize what uses the most electricity (and why). Then we test each item to find the actual wattage, using our Watts Up meter.*

**Today ... Most of our electricity comes from Fossil Fuels**

Fossil Fuels come from pre-historic animals and plants that have been buried under ground for millions of years!

Examples of Fossil Fuels are:

- coal
- oil
- natural gas

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*After introducing fossil fuels, we discuss the good and the bad about them in today's age.*

**Today ... More and more of our electricity is coming from Renewable Energy**

Renewable Energy comes from Natural Resources and we will never run out of them!

Examples of Renewable Energy are:

- wind
- sun (solar power)
- water (hydro power)

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*We follow fossil fuels with renewable energy sources and a parallel discussion of the pros and cons.*

Following the flipchart guided discussion, we break the class into three groups for hands-on exploration. Students rotate between: a model hydro-electric dam, a model wind turbine that demonstrates wind's potential power, and model hand generators that illustrate Faraday's Law of Induction.

