LESSON

Understanding What Electricity Is, Terms, and Calculation

BIG IDEA(S)

Electricity is a form of energy characterized by the movement of electrons. We can measure and describe the work done by electricity.

OBJECTIVES

Students will be able to:

- Understanding what electricity is
- Know the units used to calculate electrical power
- Recognize and explain electrical symbols
- Describe the difference between power and energy

BRIGHT SOLAR FUTURES

SOLAR

TOPIC OF STUDY

Electricity Basics

90 MINUTES

TASK LIST SUBCATEGORY

702 Recognize and use electrical concepts, terminology, relationships, and formulas

102 Describe how energy is fundamental to our everyday lives

OVERVIEW

At its most fundamental level, electricity is the movement of electrons between atoms. A long line of electrons bangs into each other, creating an electrical flow. When we move electrons we get electrical energy. Electricity itself is the name we give to the type of energy that comes from this electrical energy.We measure electricity and electrical units using several systems that are all interlinked.

KEY TERMS

amps
Ohm's Law
volts
watts
resistance
power
energy
multimeter
load

INSTRUCTIONAL

MATERIALS NEEDED

Technology: Multimeters

IMPLEMENTATION (LESSON PLAN)

LECTURE & DISCUSSION

- Present Electricity Basics: https://docs.google.com/presentation/d/1N6W5EZ_L934YOsHsfBr3lzlW4sQw4uNZwrnhVTj_Nwl/edit#slide=id.g742e3e7cd_1_16
- Discuss and present different ways to use Ohms Law Wheel to calculate volts, watts, amps, and resistance
- Electrical symbols
- Electrical units of measurement
- Ensure students have an understanding of the concept of power
- Ask students to calculate power
- Discuss energy and how it relates to power
- Ask students to calculate energy instead of power.

IMPLEMENTATION (LESSON PLAN) - CONTINUED

DISCUSSION

Why does it matter that power and energy are different?

How does all of this relate to solar energy?

ACTIVITIES

- Use a multimeter to test voltage at a power outlet
- Use a multimeter to test amps of a plugged in load
- Use a multimeter to test
  - Students pair off forming 2 parallel lines facing each other.
  - The rule is to say as many random words to each other as possible. The words cannot relate to each other in any way (so grass and then green are not allowed). For example: one person says "space" the other says "shoe"
  - You cannot repeat words nor can you say anything you see in the room
  - See how long students can go say random words to each other, game should last about a minute or a minute and a half
  - Ask students if it was hard?
  - Let them know that they know thousands of words and they use them everyday, but when asked to use them in a new way it becomes hard.
  - Did anyone come up with a strategy? Did anyone just ignore what the other person was saying?

HANDS ON EXERCISE

- How do you know when power is present? How can you measure it?
- What are electrical loads? What uses the most power in a home? – Introduce multimeters.
- Measure voltage at outlets in the classroom.
- Measure current of devices in classroom radio, fan, cell phone charger, AC, etc.

Recap day's lessons learned.

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