

RET Program Expectations

Last edited: Monday, June 1st, 2015

Limitations & Requirements

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CURRENT Goals

- Develop Better Understanding of Engineering

Mindsets



Training

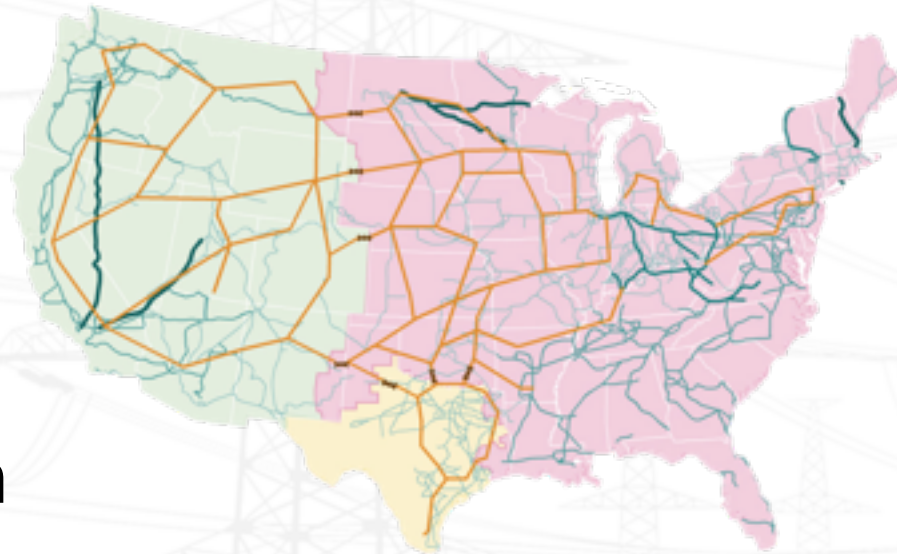


Careers

CURRENT RET Training Goals

- Provide Essential Training about Electricity

- History
- Safety
- Magnetism
- Circuits
- AC/DC
- Generation



- Transmission
- Distribution
- Power Usage

RET Outcomes

- Create materials that as closely as possible promote:
 - Interest in Engineering (EE)
 - Wide Audience Exposure (distributable)
 - Connects to Education Standards (useful)

Lesson Plan Outline

- Header (1 page Max)
- Standards
- Tasks included
- Materials
- Procedure (3 page max)
- Adaptions (1 page max)
- Assessment
- Slides or Multimedia

- Header includes a Title, Author, Subject, Grade, Description, and Goals/ Objectives.
- The procedure should be 1-3 pages maximum with emphasis on what the teacher should do and what the student should be doing.
- For more in-depth lessons, the materials used to convey the message should be provided. For activities, a multimedia recording should be made explaining the activity.

Sample: Header

Title – We Have the Power!
By – Elisa Latreille
Primary Subject – Science
Secondary Subjects – Computers / Internet
Grade Level – 3

Description:

This lesson plan is centered on the concept of renewable energy. It is a science unit that includes lessons on wind and solar power, as well as basic electric circuitry. The lessons will also cover some Earth Science concepts, as we will explore the earth's supply of natural resources and discuss the importance of renewable energy both now and in the future. We will examine our power consumption and explore the idea of using renewable energy to fill our electricity needs. The unit will culminate with group investigations and presentations of renewable energy plans for our school. The duration of the unit is 4 weeks
(20 days, one hour per day)

Why should our students learn about renewable energy and energy conservation?

Because their future depends on it. Nicole Sands of Greenpeace summarizes the hazards associated with our nation's current energy trends:
Our excessive reliance on fossil fuels feeds not only excessive air pollution, destruction of pristine areas and global warming, it also increasingly contributes to economic and regional instability around the globe. Continued fossil fuel use also contributes to the effects of global warming seen in rising temperatures, altered weather patterns and unseasonable droughts, floods and fires. (*The Green Ribbon Pledge website*)

Goals/Objectives:

- Students will be able to identify renewable and non-renewable energy sources.
- Students will build and test basic electrical circuits.
- Students will be able to explain the importance of using renewable energy.
- Students will apply their knowledge of power consumption and resource availability to address a local issue.
- Students will work in small groups to improve collaboration and cooperation skills.

Sample: Tasks

Colorado Model Content Science Standards addressed:

- Standard 1: Students apply the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.
 - 1.1: Design, plan and conduct a variety of simple investigations (for example: formulate a testable question, state a hypothesis, make systematic observations, develop and communicate logical conclusions based on evidence).
 - 1.2: Select and use appropriate tools and technology to gather and display related to an investigation (for example: length, volume, and mass measuring instruments, thermometers, watches, magnifiers, microscopes, calculators, and computers).
- Standard 2: Physical Science — Students know and understand common properties, forms, and changes in matter and energy.
 - 2.5: There are different types and sources of energy (for example: light, heat, motion).
 - 2.6: Electricity in circuits can produce light, heat, sound, and magnetic effects.
- Standard 4: Earth and Space Science — Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.
 - 4.3: Many of the Earth's resources can be conserved, recycled and depleted.

Tasks Included:

- Create and test basic electrical circuits.
- Build and test small wind turbines.
- Investigate energy usage at school and at home.
- Research renewable energy options.
- Record findings and information in personal Science Journals.
- Synthesize information to develop a "Renewable Energy Plan" for the school.
- Create a PowerPoint slideshow and present the Renewable Energy Plans to parents, teachers, and other classes.

Sample: Procedure

- **Day 1: Collaboration & Teamwork activities and discussion.**
 - **Human Knot. (10 min.)**
Have groups of 8-10 students stand in a circle. They must close their eyes, and reach across the circle and grab the hand of someone across from them. They will then take their other hand and grab the hand of someone else (who is not next to them). The group will then attempt to untangle the "knot" without letting go of one another's hands. Teams can compete against one another to see which team can untangle their knot the fastest.
 - **Paperclip Challenge (15 min.)**
Working in teams of 4-5 students, each team will be handed a paper bag containing the following items: a piece of paper, 10 paperclips, a piece of string, and five circular stickers. Teams will have five minutes to make the longest object, without talking at all. Afterwards, have students use a tape measure to measure their object. Graph results on board. Look at the longest and shortest, and some in between. Discuss what was easy and what was hard about creating their object. How did they communicate? What would they have done differently?
 - **Group Discussion (10 min.)**
As a whole class, talk about the importance of listening to others, offering suggestions, and being respectful of others' ideas. Talk about how teams are able to succeed at a task when everyone works together. Discuss how everyone has different strengths, and how these strengths can be used to benefit the group. Most importantly, talk about the importance of respecting one's peers and working together to achieve a common goal.
 - **Recognizing Strengths in Others (25 min.)**
The students will receive a class list, and will write one positive thing about each of their classmates. The teacher will then compile a list (on his or her own time) for each student with their classmates' comments to be distributed on Day 2.
- **Day 2: Introduction to energy and electricity.**
 - Hand out positive comments lists from Day 1. Reiterate the value of respecting others so that the group can succeed. (5 min.)
 - Divide the class into groups of 4-5 students. (You can do this however you see fit...) Keep a record of which students are working in each group. These teams will be working together for the remainder of the unit. (5 min.)

Time Schedule – 12.5 Days

	Monday	Tuesday	Wednesday	Thursday	Friday	# D
W1	<i>Orientation</i>	<i>Training Project Develop 1</i>	<i>Training</i>	<i>Project Develop 2</i>	<i>Training</i>	2.5
W2	<i>Project Planning</i>		<i>Project Orders</i>			5
W3						4.5
W4			<i>Materials Prep</i>	<i>Presentation & Materials Prep</i>	<i>Presentations</i>	2