

Introduction

The EnergyRight[®] Solutions for Youth (ERSY) program was developed specifically as an educational outreach service for educators with lesson plans designed for public, private, STEM and home schools as well as community groups. It aligns with state learning standards for math, science and reading, aiming to help children in third through fifth grades learn about the environment and how to use energy wisely. Third, fourth and fifth grades were chosen because at this age, the child's desire to share school experiences with parents/guardians is high, as is the adult's willingness to participate in their child's education. The child's engagement is also maximized at this age, due in part to limited sports team participation, club participation and involvement in other extracurricular activities that typically occurs in upper grades.

EnergyRight[®] Solutions for Youth lesson plans comply with state learning standards for the seven states served by the Tennessee Valley Authority (TVA) for grades three (3), four (4) and five (5). Applicable state learning standards are listed on each lesson plan, along with recommendations for the amount of time to spend covering certain parts of a given lesson, depending on the size of the group. In addition, each lesson plan lists needed materials if the educator elects to engage a group in recommended experiments.

The lesson plans cover three areas—Energy Fundamentals, Forms of Energy, and Energy Use & Delivery—and were developed for teachers, parents and group leaders. They were designed to help students gain an age-appropriate, informed view of energy and how to use it wisely in language that is easy to understand. Lesson plans can be “mixed and matched” to meet specific course objectives and can be used multiple times over the course of an entire academic year.

Introduction to Lesson Plan Format

EnergyRight Solutions for Youth is a new program for the Fall of 2014. At first release, it consists of 21 lesson plans in three categories: Energy Fundamentals, Forms of Energy, and Energy Use & Delivery. Lessons are designed for 3rd – 5th grade students in a variety of school settings (public, private, STEM schools, home schools) in the seven states served by local power companies and the Tennessee Valley Authority. Community groups (Scouts, 4-H, after-school programs, and others) are encouraged to use them as well. Each lesson is designed to give students an age-appropriate, informed view of energy. As their understanding of energy grows through the years, this allows them to make informed decisions as a good citizen or civic leader.

Lesson plans are suitable for all types of educational settings. Each lesson can be adapted to meet a variety of class sizes, student skill levels, and time requirements.

Setting	Lesson Plan Selections Recommended for Use
Smaller class size, higher student ability, and /or longer class length	<ul style="list-style-type: none"> • The “Modeling” Section contains teaching content. • While in class, students can do “Guided Practice,” complete the “Recommended Item(s)” and any additional guided practice items the teacher might select from “Other Resources.” • NOTE: Some lesson plans do and some do not contain “Other Resources.” • At home or on their own in class, students can do “Independent Practice,” complete the “Recommended Item(s)” and any additional independent practice items the teacher selects from “Other Resources” (if provided in the plan).
Average class size, student ability, and class length	<ul style="list-style-type: none"> • The “Modeling” Section contains teaching content. • While in class, students complete “Recommended Item(s)” from “Guided Practice” section. • At home or on their own in class, students complete “Recommended Item(s)” from “Independent Practice” section.
Larger class size, lower student ability, and/or shorter class length	<ul style="list-style-type: none"> • The “Modeling” Section contains teaching content. • At home or on their own in class, students complete “Recommended Item(s)” from “Independent Practice” section.

Lesson Plan Format

I. **Anticipatory Set**

An attention grabber is a short video, a cute poem, or an essential question designed to help an educator relate the topic to real-life.

II. **Modeling**

This is what the teacher will TEACH - can be a lecture, PowerPoint, etc.

III. **Checking for Understanding**

Lesson Plans contain several suggestions for checking for understanding. These suggestions correlate with Bloom's Taxonomy (higher levels of thinking). Teachers can ask questions to informally assess understanding.

IV. **Guided Practice**

This is a "guided" activity. After the teacher meets his or her objectives for a particular lesson, the students are given the opportunity to complete an activity (worksheet, game, etc.) with the guidance of the teacher.

V. **Independent Practice (at-home activities to engage the person(s) that pays the electric bill)**

Practice is done on students' own initiative, often at home. This could be an in-class activity, a quiz, homework, etc. that the student completes independently.

VI. **Assessment**

Teachers can use this section if assessment is desired. In addition, the independent practice can be used as an assessment.

VII. **Materials Needed**

Here you will find links to experiments, videos and games to reinforce learning. Each lesson plan contains a list of supplies needed to complete experiments.

VIII. **Closing the Lesson**

This section contains an essential question that the teacher can use in closing the lesson.

Set 1: Energy Fundamentals

Lesson Plan: <i>Forces and Motion</i> _____	1.1
Worksheet: <i>Find Push and Pull Forces at Home</i>	
Answer Key	
Lesson Plan: <i>Newton's First Law of Motion</i> _____	1.2
Worksheet: <i>Inertia</i>	
Answer Key	
Lesson Plan: <i>Newton's Second Law of Motion</i> _____	1.3
Worksheet: <i>Acceleration</i>	
Answer Key	
Lesson Plan: <i>Newton's Third Law of Motion</i> _____	1.4
Lesson Plan: <i>Work-Energy Relationships</i> _____	1.5
Worksheet: <i>Potential vs. Kinetic Energy</i>	
Answer Key	
Lesson Plan: <i>Simple and Compound Machines</i> _____	1.6
Worksheet: <i>How Do Machines Make Work Easier?</i>	
Answer Key	

Set 2: Forms of Energy

Lesson Plan: <i>Forms of Energy</i> _____	2.1
Worksheet: <i>Kinds of Energy in Your Home</i>	
Answer Key	
Lesson Plan: <i>The Law of Conservation of Energy</i> _____	2.2
Worksheets: <i>Energy Conservation</i>	
<i>Transformation of Energy</i>	
Answer Keys	
Lesson Plan: <i>Mechanical Energy</i> _____	2.3
Lesson Plan: <i>Chemical Energy</i> _____	2.4
Lesson Plan: <i>Light Energy and Solar Energy</i> _____	2.5
Worksheet: <i>Electromagnetic Spectrum</i>	
Answer Key	
Lesson Plan: <i>Nature of Light</i> _____	2.6
Worksheet: <i>What is Light?</i>	
Answer Key	
Lesson Plan: <i>Heat Energy</i> _____	2.7
Worksheet: <i>What is Heat?</i>	
Answer Key	
Lesson Plan: <i>Electrical Energy</i> _____	2.8
Worksheet: <i>Where Does Your Energy Come From?</i>	
Answer Key	
Lesson Plan: <i>Renewable and Non-Renewable Energy</i> _____	2.9

Set 3: Energy Use & Delivery

Lesson Plan: *Introduction to Electricity* _____ 3.1

Worksheet: *Components of the Atom*

Answer Key

Lesson Plan: *Electrical Circuits* _____ 3.2

Worksheet: *Meter Reading*

Lesson Plan: *Electromagnets* _____ 3.3

Worksheet: *Label the Magnets*

Answer Key

Lesson Plan: *Energy Delivery* _____ 3.4

Worksheets: *How I Lived without Electricity*

Parent or Guardian Interview

Lesson Plan: *Energy Efficiency* _____ 3.5

Worksheets: *Ten Ways to Use Energy Wisely*

What Can We Do to Use Energy Efficiently?

Calculate Cost to Make Things Work

Answer Key

Lesson Plan: *Energy at Home* _____ 3.6

Worksheets: *Read an Electric Bill*

Graph an Electric Bill

Interview Guide

Answer Keys
