



**UPPER ELEMENTARY STEM CLASSROOM
AND FIELD TRIP PROGRAM**

Grade Level(s): 4th grade, but could be used for 3rd or 5th grade for Wisconsin students if these particular science standards are being taught in 3rd or 5th grade instead

Subjects: Science and Engineering (STEM)

Topics: Energy, Electricity, and Green Energy

Unit Anchoring Phenomenon:

The movement of the trains at East Troy Railway Museum.

Unit Guiding Question:

What makes the trains at East Troy Railroad Museum move?

Unit Objective:

By the end of the unit, students will be able to use words, diagrams, and/or examples to describe how energy is transformed in order to make the trains at East Troy Railroad Museum move.

Social Studies Connections (Lesson 4 and Field Trip):

Comparing and contrasting home life before and after electricity.

Electric trains now and in the past.

Climate Change Connection (Lesson 6, Field Trip, and Unit Conclusion):

Electric power sources for transportation.

Standards

See chart of NGSS, Wisconsin State, Indiana State, and Climate Change standards. (Separate document)

Unit Overview:

Lessons 1-6 are field trip prerequisites that provide students with the background knowledge they need for field trip. However, if students have already learned these concepts through a different science program, these lessons can be skipped. If that's the case, please consider completing the lessons in bold below (Introduction Activity and the Field Trip Preparation sections) in order to prepare for the field trip.

<u>Lessons In the Classroom (Before the Field Trip)</u>	<u>Minimum Length</u>
Introduction Activity: Notice and Wonder	15 min activity
Pretest	10-30 minutes
Lesson 1: Energy and the Speed of an Object	1 class period, approx. 45-60 mins*
Lesson 2: Mechanical Energy Transfer Between Objects	1 class period, approx. 45-60 mins
Lesson 3: Forms of Energy and Transforming Energy	1 class period, approx. 45-60 mins
Lesson 4: Electrical Energy (With Social Studies Connections)	1 class period, approx. 45-60 mins
Lesson 5: Transforming Electricity into Mechanical Energy	1 class period, approx. 45-60 mins
Lesson 6: Energy Sources and Green Energy (Climate Change Connection)	1 class period, approx. 45-60 mins
Field Trip Preparation (Skip if Not Going on a Field Trip)	15 min lesson

* Please note that for all lessons, the Power Point lesson portion should be far shorter than the time spent on the activity.

<u>On the Field Trip</u>	<u>Minimum Length</u>
Train Ride	
Green Choices Game	
Lesson 7: Electric Car Engineering Challenge	30-45 minute activity
Museum Visit and Scavenger Hunt (added when museum display is created)	

<u>In the Classroom (After the Field Trip)</u>	<u>Minimum Length</u>
Unit Conclusion	15 min activity
Post Test (Repeat Pretest)	20-30 minutes
Teacher Survey	5-15 minutes (teacher only)