



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

Grade Level: 2nd grade recommended, but it could be used for Kindergarten-2nd grades.

The standards addressed are a 2nd grade science standard and a kindergarten through 2nd grade engineering standard.

Recommendation: As a school, choose one lower elementary grade level, such as second grade, that visits ETRM every year.

Subjects: Science and Engineering (STEM)

Topics: Engineering and Properties of Materials

Standards (NGSS, Wisconsin State, and Indiana State Standards):

2nd Grade Physical Science

2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]

Kindergarten-2nd Engineering

ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Anchoring Phenomenon:

Materials used to build trains

Guiding Question:

What materials are the best for building trains?

Objective:

By the end of the classroom lessons and field trip, students will be able to analyze data obtained from testing different materials used to build model trains. Using this data, they will be able to determine the strengths and weaknesses of how each train performs, and therefore which material is best suited for building model trains.

Social Studies Connection:

Comparing the design and materials used to build trains over time (from the past to the refurbished ETRM trains to modern trains).

Climate Change Connection:

Using light but strong materials makes trains more efficient. When it is easier for them to move, it uses less electricity and can carry more people or cargo.

Lessons/Activities **Minimum Length**

Pre-Field Trip

Introduction: KWL Chart and Vocabulary	15 minutes
Additional Material: Printable Vocabulary Posters/Flashcards	
Materials and Engineering Slides	15 minutes
Protecting Historic Trains Slides	15-45 minutes
Optional National Park Service activity sheet	
Field Trip Preparation Lesson	30 minutes

Field Trip

Train Ride	
STEM Activity: Materials for Model Train Cars	30-45 minutes
(Museum Scavenger Hunt - if available)	(15 minutes)
Vocabulary Puzzle Game	10 minutes

Post-Field Trip

Conclusion	10 minutes
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