

Electric Vehicle Project

1) Time Frame of Lesson/Unit:

15 days, block schedule 90 minutes every other day.

2) TEKS/SE:

Electronics

The student is expected to measure and calculate resistance, current, voltage, and power in series and parallel circuits.

Engineering

Student is expected to use an engineering notebook to record prototypes, corrections, and mistakes in the design process.

Student is expected to record the final design, construction, and manipulation of finished project in engineering notebook.

Mathematics

The student demonstrates geometric thinking and spatial reasoning.

The student demonstrates an understanding of two and three dimensional representations of geometric relationships.

Physics

The student is expected to calculate the relationship between force and acceleration.

Language Arts

The student compiles written ideas and design drawings into summaries and draws conclusions.

3) Problem/Challenge/Question:

We all know that gas can transport us from point "A" to point "B", but can you use electricity to do the same thing? Your challenge is to research, design, and build an electric vehicle that can be driven and navigate a road course.

4) Direct Instruction (if necessary):

Tool safety, tool usage, back ground knowledge

5) Instructional Methodologies to be utilized:

Demonstration, Direct instruction, Cooperative learning

6) Performance Expectation of Students:

Students will:

Design structural and electrical specifications

Keep a Design / Engineering notebook with all designs, modifications and calculations

Write a reflection and analysis of the project

Provide a short oral presentation of their vehicle explaining design and operation

Demonstrate operation of vehicle

7) Resources Available to Students:

32ft of 2x4 lumber,

1 4x4 Sheet of OSB Plywood,

12v-36v DC motor,

Wheels,

Pulleys,

Sprockets,

Drive Chain,

Drive belts,

Wire of various gauges,

1 box of 3 inch screws,

1 box of 2 inch screws,

Miscellaneous bicycle and scooter parts

Drill

Saw

Tape measure

Square

Computer

Calculator

8) Expected Products:

Functioning electric vehicle

Design drawings (structural and electrical)

Written reflection/analysis

Presentation/student demonstration

9) Evaluation Methodology:

Students are evaluated based on the following:

Developmental Assessment 1 - Design and Construction

Developmental Assessment 2 -Test and Design

Summative Assessment - Oral Presentation and reflection and analysis

Formative Assessment - Design and Performance