Clean Diesel Technologies for Air Pollutant Reduction (Biodiesel Project)

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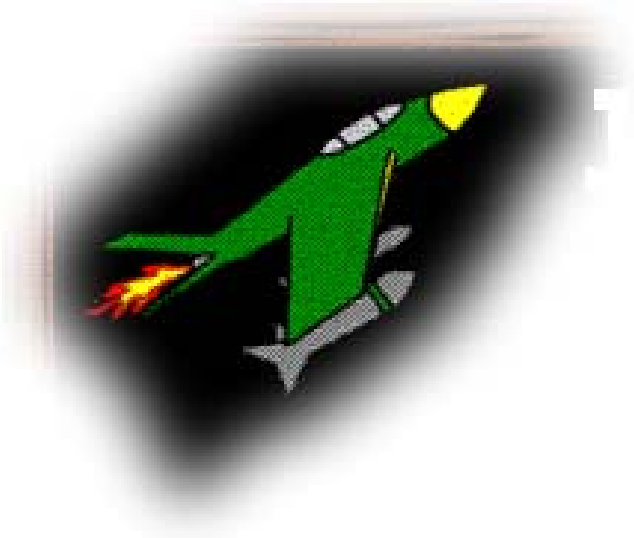
- SC-6-I-U-2
  - Students will understand that communities do not exist in isolation, but are globally interconnected by a number of Earth systems (e.g. ocean, atmosphere, lithosphere).
- SC-6-I-U-3
  - Students will understand that science can sometimes be used to inform ethical decisions by identifying the likely consequences of an action, but cannot be used to establish if taking that action would be right or wrong.
- SC-6-I-S-4
  - Students will differentiate the usefulness of scientific research to predict the possible consequences of decisions about environmental issues from its limitations in making ethical/moral decisions about those issues



Pre-unit

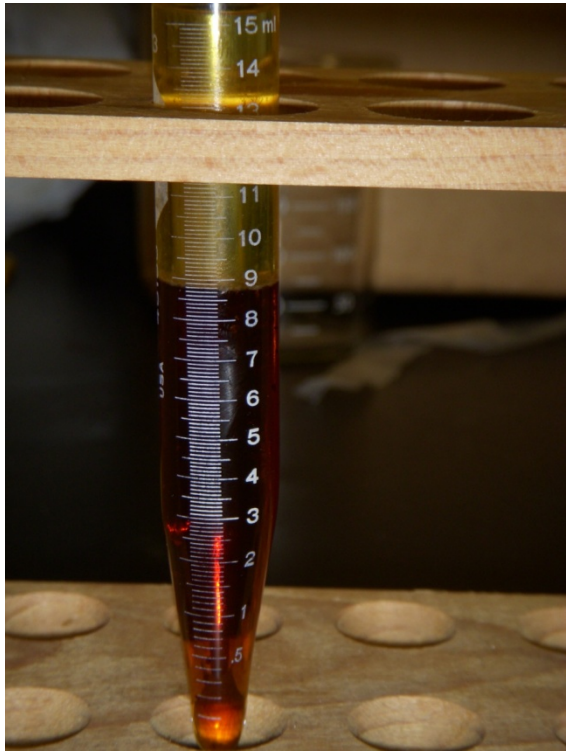
- Pre-assessment
- Movie Maker video
- Exit Slip

Day 1

- Simulation of no oil usage
- Bill Nye “Alternative Fuel”
- Homework: Survey of Oil usage

Day 2

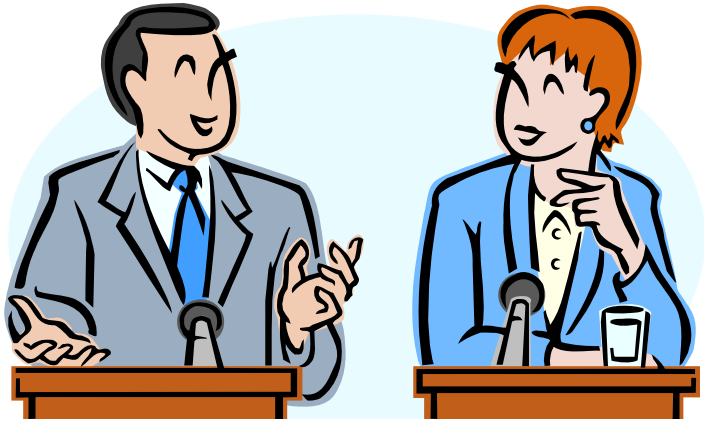
- Talk about oil usage survey results
- Biodiesel demonstration
- Introduce research project



Days 3 & 4

- Day 3
  - In groups, students research an alternative fuel Group Paper
  - Groups will present research information
- Day 4
  - Student presentations

Days 5, 6, 7



- Day 5
  - Introduce debate scenario
- Day 6
  - Class debate
  - Discussion
- Day 7
  - Open Response

Assessment

Formative

- Exit Slips
- Research Chart
- Group Presentation

Summative

- Debate
- Open Response

Newport High School

NCTM Standards

- Students will organize and consolidate their mathematical thinking through communication
- Students will recognize and apply mathematics in contexts outside of mathematics.
- Students will formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data

Trash to Treasure
AP Statistics

- Pre-assessment
  - Multiple choice questions on
    - energy use/demand
    - Statistical inference methods
    - Checking assumptions

- Interest creating videos/discussion
    - Bill Nye United Streaming Video
    - Windows Movie Maker of RET experience

Experimental Design

Math

- **“Trash to Treasure”**
- Engineering Department
- Form groups
- Select restaurant
- Discuss sampling

Collaboration

Math

- Calculate % FFA (Free Fatty Acid)
- Perform Hypothesis test
- Compute confidence interval
- Begin PowerPoint presentation

Science

- Perform titration
- Record Findings
- Transesterification

Assessment

- Group PowerPoint presentatiion detailing findings
- Individual paper