

Can I Really Deliver ELA and Math Instruction in my
CTE Program

“LET’S BE SERIOUS!”

Introductions

- ◎ Three Year Veteran Collaborators
 - Jennifer Stairs, ELA Instructor
 - Jim Wrede, Automotive Technology Instructor

- ◎ In Our First Year of Collaboration
 - Karen Shoskey, Mathematics Instructor
 - Rick Mathis, Power Equipment Technology Instructor

QUESTIONS ARE WELCOME AT ANY TIME.

Why integrate?

- ⦿ New High School graduation requirements
 - Enrollment
- ⦿ Industry Standards
- ⦿ State Career and Technical Requirements

TBAISD Career-Tech Model

- ⦿ Team Taught
- ⦿ Grading
 - ELA is 20% of overall technical grade
 - Math is 15% of overall technical grade
- ⦿ Credit Options
 - Home schools initiate an academic credit contract
 - ELA
 - Algebra 2
 - Geometry
 - 4th year math
- ⦿ All students participate in academic curriculum regardless of contract

Team Teaching

- ◎ Collaboration
 - Regular meetings in addition to instructional time
 - Moodle
- ◎ Lessons are presented by both the academic and technical instructors
- ◎ Academic instructor participates in lab activities when possible

Planning

⦿ Technical Instructor

- Defines topic/focus and provides detailed information regarding instructional objectives for the technical content
- Shares technical standards

⦿ Academic Instructor

- Reviews technical and academic standards looking for connections
- Locate instructional resources that meet both sets of standards

⦿ Together

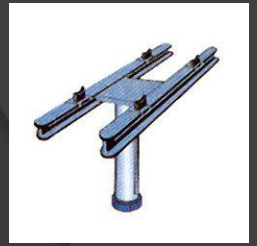
- Develop lesson plans
- Implement lesson
- Review for technical accuracy

Examples: Automotive Tech

Automotive Technology	English Language Arts
<u>All Data</u> Certification Test	Understanding organizational structure Understanding the terminology How to read questions and answers Passing the test on the first try
<u>Hoisting & Lifting</u> Safety	“The Lift” by B. S. Levy (short story) Understanding vocabulary in context
<u>Lubricating Systems & Procedures</u> Engine Oil	“The Engine Oil Bible” (article) Reading for Information
<u>Cooling Systems</u> Anti-Freeze/Coolant	“Testing Your Coolant Knowledge” (article: <i>Tomorrow’s Technician</i>) Reading for Information
<u>Tire & Rim Construction</u> Tire Specifications	“Tire Fundamentals” (article: nhtsa.gov , <i>Tire Safety Brochure</i>) Product Reports (writing assignment)
<u>Vocabulary & Terminology</u>	Weekly spelling tests

AMT Sample Reading Assignment

Excerpt from “The Lift” by B.S. Levy



In any case, this one warm and pleasant late-summer Sunday afternoon, Dale had brought his brother-in-law’s mustard-colored MGB over to our shop for a routine muffler job. Now this particular MGB was one of the unloved, late issue, fat-rubber-bumper models, and as such was bedeviled with a strange, crimped-end muffler system that I can only assume the factory assembled out of recycled fruit cocktail cans and was therefore guaranteed to blow out at least once a year. If not sooner. And the difficulty with the fat-bumper MGBs was that the exhaust pipe ran very nearly down the centerline (pardon me, *centreline*) of the car, which posed a bit of an access problem on an H-style lift like the resident piece at Mellow Motors. Our boy Dale solved this particular bother by purposely *mis*-aligning his brother-in-law’s MG on the lift, allowing the entire exhaust system (along with 49.9% of the car’s weight) to teeter alarmingly off to the left-hand side.

Is this a good idea? Why or why not?

What would have been a different solution?

AMT Sample Writing Assignment

Students were taken to the parking lot and asked to select a tire from a vehicle parked in the lot and record all the tire specifications.

Then, students had to read the nhtsa.gov, *Tire Safety Brochure*.

Finally, students had to explain each specification in 'customer friendly' terms in a product report.

Product Report

Name of Product: Manufacture & tire name

Vehicle make, model, year: Taken from VIN

Date of report: The day you write your report

Author of report: Your full name

Specifications:

1. Car type & tire width: *put specification numbers here*
Explanation: *In your own words, in terminology a novice could understand*
2. Aspect Ratio, tire construction, rim/wheel size:
Explanation:
3. Load index & speed symbol:
Explanation:
4. U.S. Dot safety standard code:
Explanation:
5. Number of ply's:
Explanation:
6. Treadwear grade:
Explanation:
7. Traction grade:
Explanation:
8. Temperature grade:
Explanation:
9. Max. cold inflation:
Explanation:
10. Load limit:
Explanation:

Directions:

For the explanation, be sure to include a detailed description of the specification and answer why a customer should care about this specification. For example, does it mean the tire is safer?

Your final product report should be formatted exactly like this example, including the line between the header and the list of specifications. If you need help, ask!

Please type your report in size 12 font (not smaller!) and double space between each specification.

Examples: Power Equipment

Power Equipment	Technical Math
<u>Measurement</u> Calipers Micrometers	Addition of Decimals Subtraction of Decimals Division of Decimals Multiplication of Decimals
<u>Electrical Troubleshooting Utilizing Schematics</u>	Addition & Subtraction of Decimals Determining the missing unit (using OHMs law)
<u>Compression Ratios</u>	Multiplication of Decimals Division of Decimals Cylinder Volumes Volumetric Calculations (cylinder head)
<u>Gear Ratios</u>	Multiplication & Division of Decimals (compare and contrast)

PET Sample Problems

- ⦿ The total displacement in a 4-cylinder engine is 144.2 cubic inches. What is the displacement in each cylinder?
- ⦿ Pitch is the distance between the threads on a bolt or screw. In each turn, a bolt or screw moves a distance of the pitch. The pitch of a thread is 0.125 inch. How far, in inches, is a nut moved in 12.5 turns?

One Step Further

⦿ Electrical Unit

- AMT & PET combined
- ELA presented to whole group
 - “Chapter 14: Batteries” from *Automotive Electricity & Electronics* by James D. Halderman
 - Battery Lesson Stations 1-6 & Quiz
 - Reading for Information
- Math presented to whole group
 - Ohm’s Law
 - Series Circuits
 - Parallel Circuits
 - Metric conversions

Working on Electrical Boards



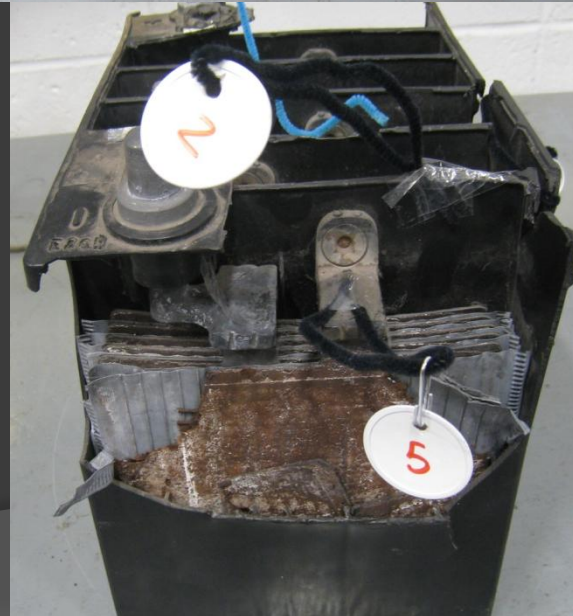
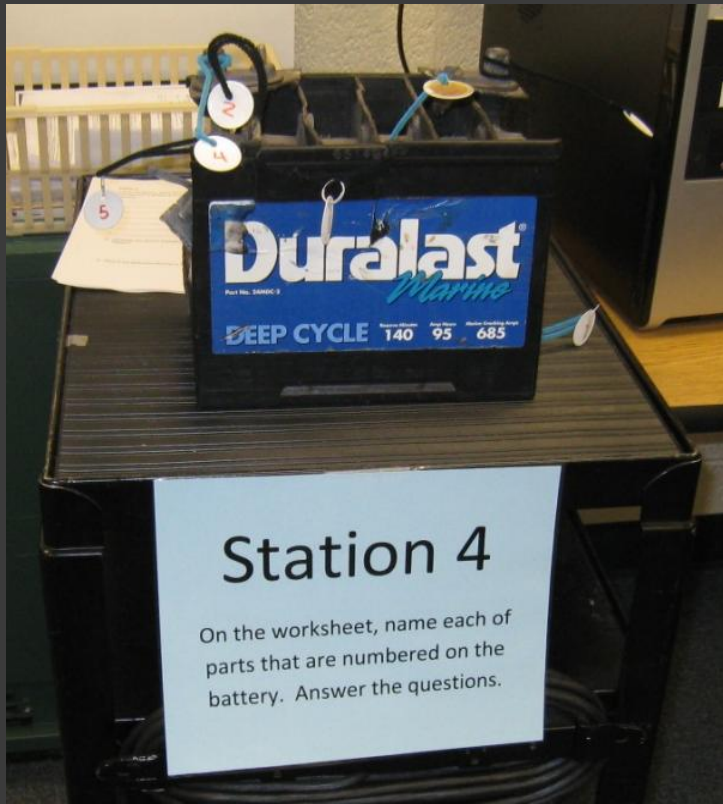
Math Instruction in Ohm's Law



Applying Ohm's Law in the Classroom



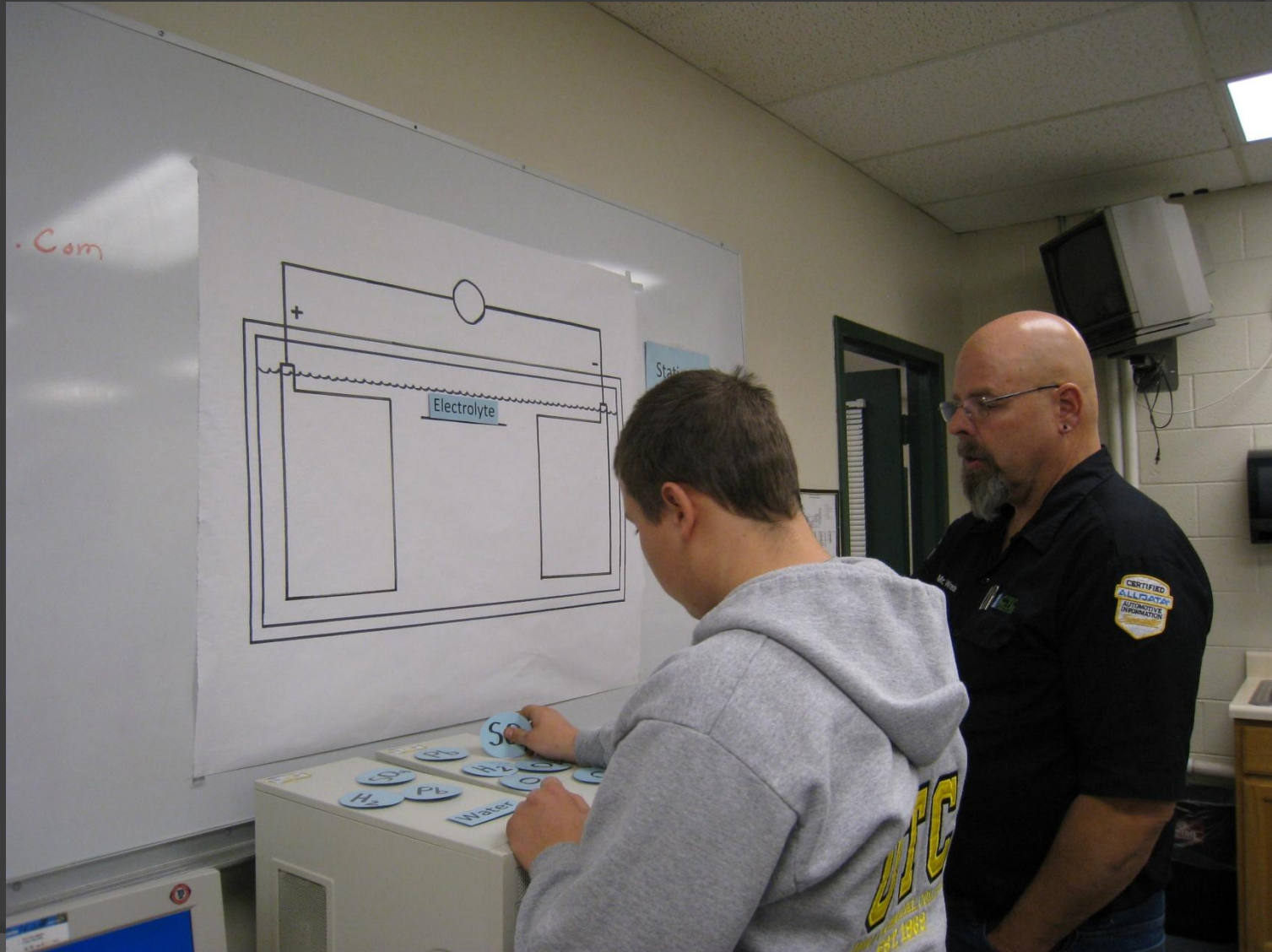
Labeling Battery Components



ELA Check Point: Build a Cell



Charging & Discharging a Battery



Conclusions

- ◎ Be patient
- ◎ Be flexible
 - Scheduling
- ◎ Be open to change
- ◎ Don't be afraid to try new things

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