CTE Lesson Plan

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Pathway:	**Cluster:**	**Course:**	**Grade Level:** *(check all that apply)*
Science, Engineering & Technology	Transportation, Distribution & Logistics	Automotive Technology I	☐ 6 ☐ 7 ☐ 8 ☐ 9 ☑ 10 ☑ 11 ☑ 12

Project Name: Electrical Boards

Objective(s): For students to understand how wiring operates on vehicles.

Primary Unit of Study (from Scope & Sequence): Introductory Electrical
Secondary Unit of Study (if applicable): Introductory Electrical

College & Career Readiness Standards:

Software: None

Materials Required: 12v power supply, 12v motors, 12v lights, automotive relay, wiring to connect all components.

Prerequisite Skills: Understanding on electrical theory.

Time Required: 5 hours for wiring diagram, 15 hours for board building, 2 hours for voting and assessments.

Essential Questions: How does Ohm's law apply? What can electricity be used for?

Key Vocabulary: Ohm's law, Watt's Law

Procedure/Instruction: Students are required to design a wiring diagram (see attached sheet). The wiring system must put the energy to use. For example, a fan blade attached to a motor can be use as a fan to cool off a hot object or to make a wind for a sailboat.

Closure: After all of the boards are complete, students will vote for their favorite boards and rate their group peers.

Evaluation/Assessment: Teacher will grade the wiring diagram, final board, and voting. Students will grade their own peers.

Differentiation Strategies: Students may be allowed additional time. Students are the given the choice of what type of board they would like to build. Students are allowed to elaborate on their board as they would like.

Additional Resources:

Additional Files: See attached for instruction sheet, rubrics and example.

Name: _____ School:_____

Name: _____ School: _____

Name: _____ School: _____

Group Name: _____

Electrical Boards

Please follow all the steps. If you lose this sheet, then you will have to **start over or take a 0 for a grade**. Groups can be from 1 person to 3 people with the approval of the teacher. All members of the group must be caught up on their assignments. If a person is found to be behind on their assignments, they will be removed from the group. The group formation deadline is the end of class on 1/25/12. After that, the teachers may place you in a group.

1. You need to draw a wiring diagram that uses at least a fuse, switch, relay and load. The load must perform a function. The diagram must also have a legend stating what all the symbols mean or label all parts. You must label all parts of the wiring diagram as you would see from a real wiring diagram. Be sure to include wire colors, circuit numbers, splices, grounds and so on. You can view the examples on the online site or see a teacher for help. You cannot move on from step 1 to 2 without teacher's approval and grade.
2. You need to get the materials you need to construct your circuit. You may have to substitute one load for another. For example if we do not have enough motors, than you may have to use a light bulb. You have until the deadline to finish your project. When you are done, you need to have a teacher grade it.
3. **You do this part of the assignment as an individual, not a team.** Once both assignments are complete, you will need to do a peer assessment on your teammates. If you did not have any (you worked alone), you still need to do this step. Go to our online classroom and select the link on topic 8 for the assessment.
4. **You do this as an individual, not a team.** Vote for your favorite boards.

The 1st place team wins a prize that will be announced later. You should learn how to work with others and operating effectively in a setting that encourages critical thinking and problem solving. You need to work within the rules as you complete your assignment and ask a teacher if you have questions regarding what you can and can't do if they are not clear. Remember to try and be creative. After you complete the assignment, you should know how to read a wiring diagram and how to diagnose a circuit.

Grading	Grade	Teacher Sign off
Wiring Diagram		
Project board		
Peer Assessment		
Voting		

Electrical Boards

Team Name: _____ Class:_____
Member 1: _____
Member 1: _____
Member 1: _____

CATEGORY	4	3	2	1
Required Elements	The board has all of the elements that is required and more. Wiring diagram, switch, load, relay and circuit in an organized and neat way	The board has all of the elements required and is acceptable appearance.	The board is missing 1 or 2 elements	Several required elements were missing. It was not finished.
Functionality	The circuit functions properly when operating the control device. Circuit works as drawn in the wiring diagram.	The circuit functions properly but may not match exactly the wiring diagram.	The circuit does work, but does not match the wiring diagram.	The circuit does not work at all.
Labels	All items on the wiring diagram were labeled properly and there was a legend in place. Stating the meaning of all symbols	Almost all items of importance on the diagram are clearly labeled.	Several items of importance on the diagram are clearly labeled.	Few items were labeled or non at all.
Originality	The wiring diagram and board used for the project reflect a exceptional degree of student creativity in their creation and/or display.	One or two of the components of the wiring diagram reflect student creativity in their creation and/or display.	The designs are made by the student, but are based on the designs or ideas of others.	No originality.
Attractiveness	The board and diagram is exceptionally attractive in terms of design, layout, and neatness.	The board and diagram is attractive in terms of design, layout and neatness.	The board and diagram is acceptably attractive though it may be a bit messy.	The board and diagram is distractingly messy or very poorly designed. It is not attractive.
Total: x5 Grade:	Mulitply total points by 5 for complete grade. Write grade in category box.			

ULTRA ROBUSTE

HEAVY DUTY

INDUSTRIAL

Sailing to

Fuse

Bulb (load)

Sail Boat

Fan

Relay

Switch

Splice 3