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| **Course:** Introduction to Engineering | | | | | | |
| **Unit:** Basic Electricity | | | | **exercise:** Short Circuits and Protection Devices | | **Time Frame:** 1 - 2 Hours |
|  | Preparation: *Summary of “to do’s” that the teacher should understand and prepare before bringing this lesson to the classroom.* | | | | | |
| **Information:**  Before starting this assignment, students should have an understanding of material covered in:   * Short Circuits and Protection Devices   **Materials:**  **Tools:**   * Internet | | | | | | |
|  | Safety: *Summary of safety strategies in the lesson.* | | | | | |
| There are no safety strategies for this exercise. | | | | | | |
|  | Desired Results: | | | | | |
| Established Goals: | |  | Transfer: | | | |
| *Problem Solving Techniques and Applications Standards:*  Teachers should use the STEM Academy Standards Correlation System available in the STEM Connections area of a unit to extract specific standards and insert these standards here. | | *Students will be able to independently use their learning to…*   * Identify and understand protection devices; * Understand the hazards of an electrical or electronics laboratory. | | | |
| Meaning: | | | |
| Understandings  *Students will understand that...*   * There are products available to prevent products from short circuiting and destroying other products. | | Essential Questions  *Students will keep considering...*   * Other situations and conditions in an electric that cause harm to devices; * Other devices similar to a fuse. | |
| Acquisition OF KNOWLEDGE AND SKILL: | | | |
| *Students will know...*   * The correct use of a fuse; * Conditions that can cause electric shock. | | *Students will be skilled at...*   * Constructing circuits; * Identifying the different parts of circuits. | |
|  | Evidence: | | | | | |
| Evaluative Criteria: | |  | Assessment Evidence: | | | |
| * Correct answers | | | *Performance Task(s):*  Short Circuit and Protection Devices:  In this assignment, students will learn and be tested on various situations where a short circuit will occur. | | | |
| * Completed successfully * Correct answers | | | *Other Evidence:*   * Student worksheet * Online quiz | | | |
|  | Learning Plan: *Summary of Key Learning Events and Instruction* | | | | | |
| **Outline:**   1. Set Introduction   Take this time to briefly review some of the safety rules in your lab that deal with electricity. During this unit your students will be dealing with different electrical components that could be dangerous if handled wrong.   1. Review   Review the discussion section with your students. Provide as many hands-on examples as you can.   1. Fuse Examples   When covering the section on fuses, bring in several different types for your students to observe. Provide both good and bad fuses so they see the difference. These can be cheaply purchased at any hardware store.   1. Journal   At the end of the discussion have your students open their student journals and complete the corresponding questions under the procedure section.   1. Quiz   A short five question T/F quiz is available for your students to complete at the end of class.  **Progress Monitoring:**   * The instructor will need to monitor the classroom, checking student’s work and ensuring students are on task and following directions. * Ensure students store their projects at the end of class and leave all materials in the room. * At the end of the activity, post student projects in the room and provide appropriate feedback. | | | | | | |
|  | Differentiation: *Summary of Key Differentiation Techniques* | | | | | |
| Please use this space to insert your differentiation techniques. Depending on the needs of students, various techniques might be needed in a classroom, therefore use the information below and experts in the area needed to design your plan for differentiation.  The ASCD Study Guide for Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.  by Carol Ann Tomlinson, Jay McTighe  Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.  by Carol Ann Tomlinson, Jay McTighe  ISBN-13: 978-1416602842  ISBN-10: 1416602844  Differentiating Reading Instruction  *by Laura Robb.*  ISBN13: 9780545022989  A Teacher's Guide to Differentiating Instruction  The Center for Comprehensive School Reform and Improvement | | | | | | |

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|  | career Connections: *Summary of Career Opportunities Associated with this Lesson* |
| Please use this space to insert careers that might be connected to this lesson. This section will need continuous updating as new careers and emerging technologies change the opportunities available in the workforce.  Good sources for career connections:  Occupational Outlook Handbook  <http://www.bls.gov/ooh>  The National Career Clusters® Framework  <http://www.careertech.org/career-clusters> | |
|  | Keywords: *Please Insert Keywords from this Lesson with their Definitions* |
| Please use this space to insert keywords and their definitions  Use resources like [dictionary.com](http://dictionary.reference.com/) to find definitions to your keywords | |