**Lesson Information**

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| Lesson: (3 of 3) Circuit Elements Length: 90 minutes  Unit: (3 of 3) System Design  Course: Electrical |

**Content Assumptions**

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| Prior to this class, students have taken math and construction drawing classes as well as lesson 2, “Regulations”, of the first electrical unit, “Basic Theory and Practice.” |

**Essential Questions**

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| 1. How are overcurrent protection devices used in circuits? 2. How do National Electrical Code® regulations apply to overcurrent protection? |

**Objectives Assessments**

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| After completing this lesson, students will be able to:   1. Explain the importance and application of overcurrent protection devices in circuits. 2. Demonstrate their understanding of National Electrical Code® regulations related to overcurrent protection. | 1. Worksheet — key/Instructor observation 2. Regulation translation and relation — rubric |

**Activities/Instruction**

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| **Show and Tell** (30 minutes)  Using samples (as listed in the Materials section), Instructor explains circuit breakers, fuses, contactors, and relays, including why they are important, how they work, how they are selected and calculated, how to read wiring diagrams involving them, and related National Electrical Code® (NEC®) regulations. Students ask questions and take notes.  **Work it Out** (20 minutes)  Instructor guides students through the Internet worksheet (listed in the Materials section) about overcurrent protection.  **Translate and Relate** (40 minutes)  Using copies of the current edition of the National Electrical Code® (NEC®) and their wiring diagrams from the previous lesson (as listed in the Materials section), students are to locate the sections of the NEC® relevant to the elements they chose, translate those sections into everyday language, and relate them to their wiring diagrams. |

**Materials**

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| For students:   * http://www.allaboutcircuits.com/worksheets/over\_i.html (Worksheet about overcurrent protection; includes key) * Copies of the current edition of the National Electrical Code® * Electrical wiring diagrams of residential control circuits (see previous lesson, “Circuit Elements”)   For Instructor:   * Samples of circuit breakers, fuses, and a variety of contactors and relays * [REGULATION TRANSLATION - RELATION RUBRIC] |