Course Title – Home Improvement

Implement start year – 2017-2018

Revision Committee Members – Becki Ellis rellis@lrhsd.org, x8905; Charles Markovitz cmarkovitz@lrhsd.org, x8649

Unit #3 - Electrical Unit

Transfer Goal –

Students will be able to independently acquire and apply essential technical skills to apply electrical theory to install wiring in real world situations.

Stage 1 – Desired Results

Established Goals	**21st Century Themes** **(www.21stcenturyskills.org)**
2009 NJCCC Standard(s), Strand(s)/CPI # (http://www.nj.gov/education/cccs/2009/final.htm) **Common Core Curriculum Standards for Math and English** (http://www.corestandards.org/) 8.2 Technology Education, Engineering, and Design	___ Global Awareness ___Financial, Economic, Business and Entrepreneurial Literacy ___Civic Literacy ___Health Literacy ___Environmental Literacy

All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment. G. The Designed World: The designed world is the product of a design process that provides the means to convert resources into products and systems. • 8.2.12.G.1 Analyze the interactions among various technologies and collaborate to create a product or system demonstrating their interactivity. CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. CCSS.ELA-LITERACY.WHST.9-10.2.F Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). 9.1 21st-Century Life & Career Skills All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures. 9.1.12.A.1 Apply critical thinking and problem-solving strategies during structured learning experiences.	**21st Century Skills** Learning and Innovation Skills: _x__Creativity and Innovation _x__Critical Thinking and Problem Solving _x__Communication and Collaboration Information, Media and Technology Skills: _x__Information Literacy _x__Media Literacy _x__ICT (Information, Communications and Technology) Literacy Life and Career Skills: _x__Flexibility and Adaptability _x__Initiative and Self-Direction _x__Social and Cross-Cultural Skills _x__Productivity and Accountability _x__Leadership and Responsibility

Enduring Understandings: *Students will understand that . . .*	**Essential Questions:**
EU 1[CK3] the electrical distribution provides a location to branch all individual circuit lines as well as provide individual and master shut off capability.	*EU 1* • How are you affected when the power goes out? • What would happen if power was run directly from the power company into your home? • Why do houses need more power now than when they were originally built? • How does electricity travel to your devices inside your home?
EU 2 wire size and conductor count are determined by the load and purpose of the circuit.	*EU 2* • How does the flow of water relate to electricity? • Why are there multiple sizes and types of wire?
EU 3 different systems[CK4] require a variety of circuits.	*EU 3*[CK6] • What would happen if there was no standard wiring color code? • Why is it important to know the wiring of your house when hanging holiday lights?

Knowledge: *Students will know . . .*	**Skills:** *Students will be able to . . .*
EU 1 • the procedure to shut off electricity to create a safe working condition. • what a fuse, outlet, switch, and breaker is. *EU 2* • the principle of Ohm's law. • how ohm's law determines wire gauge. • the purpose of multiple conductors in shielded cable. • the smaller the gauge wire the easier it is to manipulate. *EU 3* • the components of the various circuits in a building • how to run a wire through a wall. • the length a conductor should be stripped. • how to ground a circuit safely and the procedure of doing it. • the color code of wiring.	*EU 1* • safely perform the procedures to wire outlets, switches, and breakers. • locate the power source for a building. *EU 2* • determine wire size. • identify multiple shielded cables. • safely strip cables. *EU 3* • safely install a wire in a wall according to building code. • safely install a wire staple around the cable. • perform the grounding of a circuit according to building code. • trace the flow of electricity through a circuit.

Stage 2 – Assessment Evidence

Other Recommended Evidence: *Tests, Quizzes, Prompts, Self-assessment, Observations, Dialogues, etc.*

- Quiz/Test
- Discussions
- Drawings

Stage 3 – Learning Plan

Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: *Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.*

- Teacher led discussions on power distribution, circuits, and wires. (A)
- Teacher led discussions on Ohm's Law. (A)
- Teacher demonstration of proper wiring techniques (M)
- Teacher demonstration of how to use a multi-meter (A)
- Student practice on using a multi-meter on circuits (M, T)
- Student demonstration of circuit wiring (T)
- Create a full scale layout of circuits. (M,T)
- Videos on electricity distribution and circuitry of residential and commercial structures which can be found on youtube.com. (A)
- Worksheets on Ohm's Law (M)