

DESE Model Curriculum

GRADE LEVEL/UNIT TITLE: 11-12/Electricity

Course Code:

COURSE INTRODUCTION:

This course includes electrical wiring, electrical motors, concrete masonry, plumbing and sewage disposal, farm fences, product handling and processing equipment, and farm buildings. (CD 016720, CIP 01.0201)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation's workforce. Basic construction skills and knowledge in electricity, plumbing, concrete, and masonry are necessary for the building of agricultural structures.

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UNIT DESCRIPTION: Students will learn to identify and describe Electricity terminology and practices used in the Agriculture industry.		SUGGESTED UNIT TIMELINE: ??? CLASS PERIOD (min.): 50 MINUTES				
ESSENTIAL QUESTIONS: 1. How are electricity terms and practices used in the Agriculture industry?						
ESSENTIAL MEASURABLE LEARNING OBJECTIVES	CCSS LEARNING GOALS (Anchor Standards/Clusters)	CROSSWALK TO STANDARDS				
		GLEs/CLEs	PS	CCSS	OTHER	DOK
1. Identify the dangers and safety practices associated with electrical work.				A-CED-4 L11-12.6 RST11-12.9	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	1
2. Identify the terms associated with electrical work.				A-CED-4 RST11-12.4 RST11-12.9 L11-12.6	PST.01.01 PST.02.01 PST.02.02 PST.03.04	1

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					PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	
3. Match types and sizes of wire and their uses.				A-CED-4 L11-12.6 RST11-12.3 RST11-12.9	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	2
4. Identify the importance of grounding and GFCI protection.				A-CED-4 RST11-12.9 L11-12.6	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	2

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5. Locate lights, outlets, and switches, and identify circuit protection needs.				A-CED-4 RST11-12.3 RST11-12.9 L11-12.6	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	2
6. Identify the symbols used in agricultural wiring plans.				A-CED-4 L11-12.6 RST11-12.9	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	2
7. Describe practices for running wire to an agricultural structure and wiring within the building safely.				A-CED-4 RST11-12.9 L11-12.6 SL11-12.4	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03	2

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					PST.04.04 PST.05.01 PST.05.02 PST.05.03	
8. Identify procedures for connecting the drop wires and branch circuit wires to the SEP.				A-CED-4 RST11-12.9 L11-12.6	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	2
9. Describe how to run wiring from the SEP to a junction box, lights, and receptacles.				A-CED-4 RST11-12.9 L11-12.6 SL11-12.4	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	2
10. Calculate cost and electrical power using Ohm's Law.				A-CED-4 RST11-12.7	PST.01.01 PST.02.01 PST.02.02	2

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					PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	
11. Describe procedures for planning and installing lighting protection.				A-CED-4 RST11-12.9 L11-12.6 SL11-12.4	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	2
12. Identify problems in electrical systems.				A-CED-4 RST11-12.9 L11-12.6	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02	2

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					PST.05.03	
13. Demonstrate an understanding of how to work with electricity and wiring by diagramming a wiring plan for an agricultural structure, identifying sources of electrical grounding in the structure, and completing a bill of materials for the project.				A-CED-4 RST11-12.9 L11-12.6 SL11-12.4 WHST11-12.2	PST.01.01 PST.02.01 PST.02.02 PST.03.04 PST.04.01 PST.04.02 PST.04.03 PST.04.04 PST.05.01 PST.05.02 PST.05.03	3
ASSESSMENT DESCRIPTIONS*: (Write a brief overview here. Identify Formative/Summative. Actual assessments will be accessed by a link to PDF file or Word doc.) <p>Students will diagram a wiring plan for a machinery shed using the appropriate symbols and identify sources of electrical grounding in the building. They will also complete a bill of materials for the project.</p> <p>Assessment will be based on the overall content and presentation of the work.</p> <p>*Attach Unit Summative Assessment, including Scoring Guides/Scoring Keys/Alignment Codes and DOK Levels for all items. Label each assessment according to the unit descriptions above (i.e., Grade Level/Course Title/Course Code, Unit #.)</p>						
Obj. #	INSTRUCTIONAL STRATEGIES (research-based): (Teacher Methods)					
1-12	1. Lecture, Discussion, Study Questions, Group and Individual Project Work.					
1-13	2. Group and Individual Project Work, Presentations, and Evaluation of Projects by Peers and Teacher.					
	3. Optional – Field Trip to Farm Sites.					
Obj. #	INSTRUCTIONAL ACTIVITIES: (What Students Do)					

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1-12	1. Students will engage in study questions in lessons 1 through 12.
1-13	2. Students will complete “AS 1.1, Electricity on the Internet”; “AS 2.1, Electrical Terms”; “AS 3.1, Calculating Feeder Wire Size”; “AS 4.1, Grounding and GFCIs”; “AS 5.1, Evaluating Lights, Outlets, Switches, and Circuit Protection”; “AS 6.1, Diagramming Electrical Wiring”; “AS 7.1, Diagramming the Service Stack”; “AS 8.1, Identifying SEP Components”; “JS 9.1, Wiring a Three-Way Switch”; “AS 10.1, Calculating Electrical Costs”; “AS 11.1, Assessing Lightning Protection”; and “AS 12.1, Using Test Devices.”
	3. Additional activities that relate to the unit objective can be found under the heading “Other Activities” in the following locations: p. V-14, p. V-28, p. V-47, p. V-61, p. V-71, p. V-119, p. V-150, and p. V-180.
UNIT RESOURCES: (include internet addresses for linking) <ul style="list-style-type: none"> • <i>Agricultural Structures</i>. University of Missouri-Columbia, Instructional Materials Laboratory, 1999. (www.mcce.org) • Cook, J. B., & Nickolaus, G. F. <i>Basic Procedures in Administration of Zoning Regulations: Appeals</i>. MU Extension. University of Missouri-Columbia. Accessed January 17, 2012, from http://muextension.missouri.edu/explore/commdm/dm7613.htm. • Cook, J. B., & Nickolaus, G. F. <i>Basic Procedures in Administration of Zoning Regulations: Making Applications</i>. MU Extension. University of Missouri-Columbia. Accessed January 17, 2012, from http://muextension.missouri.edu/explore/commdm/dm7612.htm. • Home Electrical Wiring. DoItYourself.com Inc. Accessed January 17, 2012, from http://doityourself.com/electric/index.htm. • Local regulatory agencies, such as the planning and development department, public works department, and county board of commissioners • NFPA Online. National Fire Protection Association. Accessed May 23, 2012, from http://www.nfpa.org/index.asp • Students may use additional outside sources to complete this activity. 	