Goodheart-Willcox Publisher

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Goodheart-Willcox Publisher Correlation of *Agricultural Mechanics and Technology Systems* ©2017 to Tennessee Department of Education Standards Course: Principles of Agricultural Mechanics (5944)

	STANDARD	CORRELATING PAGES
	Safety	
1	Identify the benefits of knowing and applying basic safety procedures in both an agricultural laboratory and workplace. Interpret current Occupational Safety and Health Administration (OSHA) guidelines to conduct a compliance review of the agricultural laboratory, including a written summary justifying the findings with recommendations for improving the safety of working conditions.	19, 88–114, 116, 117, 913–914, 995
2	Review common laboratory safety procedures for tool and equipment operation in the agricultural mechanics laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy.	93–114, 116, 117, 184–186, 800–802, 843–846, 854, 865–866, 995
	Project Management	
3	Outline the basic principles and procedures of effective project planning. Create and present a project plan for an agricultural mechanics project or a supervised agricultural experience program related to agriculture mechanics.	54–60, 62, 256–273, 277, 308–320, 389–390, 497–500, 516, 709–712, 741
4	Using industry-specific terminology, identify components for preparing a budget and cost estimate. Develop a budget using a scaled drawing or blueprint to construct or repair an agriculture mechanics project.	258–261, 276, 272–273, 277, 432, 497–500, 517, 675, 709–712, 741
	Engine and Motor Mechanics	
5	Compare and contrast the chief features, functions, and applications of two-cycle engines, four-cycle engines, and electric motors. Citing technical references, recommend a maintenance schedule specific to the working environment (such as indoor/outdoor conditions, exposure to heat	600–620, 623, 898–914, 917, 924–934, 936, 937, 956–970, 975

	or cold) of the engine and/or motor. Conduct the appropriate maintenance with adherence to specifications outlined in the schedule.	
6	Identify and differentiate between the different types of fuel and power sources used in conjunction with engines and motors. Recommend the types and sizes of engines/motors best suited for a range of applications. Provide a written justification, citing specific textual evidence, to support the recommendation.	18, 66–70, 604–611, 623, 910–911, 917, 920–924, 936, 937
Surveying		
7	Using topographical maps and appropriate mathematical equations, determine the acreage of a specific plot of land. Document and defend the methods used to arrive at the result, annotating calculations and field notes in a manner easily retrieved by other readers.	334–343, 347, 497–499, 516
8	Apply precision surveying processes and geographic information system (GIS) technology to calculate the acreage of a specific plot of property. Using field notes and digital data (such as GIS overlays), develop a written survey report of the designated plot to include, at minimum, measurements, degrees, markers, and other notable geographic parameters.	75–77, 85
Irrigation and Drainage		
9	Analyze the interrelationships among plants, water, air, and soil to maximize the health and productivity of agricultural crops. Calculate the permeability rate, available water holding capacity, pH levels, and nutrient levels for a specific soil type.	326–330, 346, 471–473, 478–485, 489, 491, 650–654, 674, 675
10	Apply physics concepts governing various pumping systems and delivery options to achieve the optimum irrigation and drainage required for row crop, greenhouse, and nursery operations in various soil-plant-climate combinations. Develop irrigation schedules to satisfy the design daily irrigation requirements (DDIR) for specific crops, citing specific textual evidence.	470–478, 481–486, 623, 650–671, 674, 675
11	Compare and contrast irrigation methods for row crops, attending to such factors as water conservation, efficiency, and cost.	652–665, 674, 675

	Investigate and document findings on the effectiveness and efficiency of a surface irrigation versus a drip irrigation method, developing claim(s) and counterclaim(s) for scenarios in which each method would be most applicable.	
Agricultural Structures		
12	Interpret plans and working drawings to select appropriate building materials for a given agricultural structure. Using correct units and measurements, draft a written bill of materials enumerating the quantities of each selection, including but not limited to concrete, masonry, wood, metal, and composite materials.	226–248, 258–261, 273, 277, 308–310, 323, 355–357, 370, 371, 389–390, 432, 709–712, 741
13	Applying construction principles pertaining to wood, concrete, metal, masonry, plumbing and electricity construct or repair an agricultural structure according to prescribed working plans.	308–320, 350–367, 381–399, 403, 406–428, 431, 432, 549–564, 567, 586–594, 597, 626–642, 645, 661–671, 675
Agricultural Metalworking		
14	Compare and contrast the physical and chemical properties of arc welding, metal inert gas (MIG) welding, gas welding, soldering, and brazing. Demonstrate the ability to precisely follow operational and safety procedures for each fusion process across various applications.	744–763, 766–771, 778–813, 817, 820–851, 854, 855, 858–873, 876–877
15	Classify the physical and chemical properties associated with various metal-cutting methods. Demonstrate adherence to operational and safety procedures for using oxy-fuel or plasma in applications involving mild steel, copper, sheet metal, and cast iron.	744–766, 774, 775, 880–892, 894, 895
16	Select and demonstrate the best method to construct, connect, or repair metallic and non-metallic materials for a variety of agricultural applications, including but not limited to plumbing, sheeting, and equipment.	230–246, 253, 633–642, 665–667, 730–738, 741, 875