CASE 4 Learning Agricultural Power and Technology Curriculum Assessment

Number	AED Standards	CASE 4 Learning APT Performance Objectives
Safety Standards		
1a.1	Identification and use of basic hand tools	Select correct hand tools for a specific job after studying all hand tool groups
		Compare precise and accurate measurements using a combination square and caliper
		Fabricate a nut and bolt with a tap and die
		Observe the effect of torque on fastener performance
		Test the strength and durability of different fasteners and determine where they should be used
1a.2	Use of electric tools	Identify the components of a power tool and determine any hazards present by using a safety evaluation form
		Write an operating procedure for using a power tool safely
1a.3	Use of air tools	Observe and demonstrate the relationship between airflow and air pressure
1a.4	Use of hydraulic tools	
1a.5	Use of lifting equipment	
1a.6	Use of various cleaning equipment	
1a.7	Use of fluid pressure testing equipment	
1a.8	Environment of service facility	
1a.9	Machine identification and operation	Develop a technical manual for machines that use different forms of energy
		Determine how lubrication can reduce the friction produced in a machine
		Develop a technical manual for machines that use different forms of energy
		Prepare solutions of water and antifreeze and compare their physical properties
		Calculate the viscosity of different oils at varying temperatures
		Identify the simple machines and types of motions found in agricultural equipment
		Measure the mechanical advantage of different classes of levers and identify where levers are used in agriculture
1a.10	Mandated regulations	Identify types of PPE and their uses in the shop
1a.11	Shop and in-field practices	Prepare an emergency first aid booklet
1a.12	Hazard identification and prevention	Identify workplace hazards and the causes for accidents
		Develop a standard set of safety requirements for an agricultural shop.
		Assess a shop to determine if safety standards are being met and make recommendations for changes
Administrative		
1b.1	Comprehend basic academic functions	Calculate the work completed by a machine
		Calculate and compare power in English and SI units
		Measure the size of materials and convert the measurements to fractions or decimals
		Use the Pythagorean Theorem to determine if an area is square and square a corner using a 3-4-5 triangle
1b.2	Utilize industry software and electronic communications systems and reference resources	
1b.3	Awareness of dealership goals, objectives and policies	Students will identify technical skills, careers, and knowledge needed in mechanical systems
1b.4	Define basic business practices	
1b.5	Describe functions of the dealership service department; explain department goals and procedures	Read and interpret an operation manual
		Use a technical manual to develop a maintenance schedule for a small engine
		Develop a flow chart for solving a problem for a machine and use the chart for troubleshooting
Electronics/Electrical Systems		
2.1	Fundamental knowledge	Construct an electric motor and identify the parts and their functions
		Design and test a wet cell battery to power an electric motor
		Construct an electromagnet
2.2	Ohm's law	Calculate amps, volts, and ohms in a circuit using Ohm's Law.
		Construct a parallel and series circuit
2.3	12/24 volt cranking circuits	
2.4	12/24 volt charging circuits	
2.5	Lighting, accessory and control systems	Define an open and closed circuit
		Demonstrate how a resistor affects the electrical current in circuit.
2.6	Electrical schematics/diagrams	Read a schematic and construct a circuit.
		Build a complete electrical circuit
2.7	SAE computer Can-Bus standards	

2.8	Diagnostics	Design, construct, and test an electrical circuit that meets certain specifications.
Hydraulics/Hydrostatics		
3.1	Theory and operation, hydraulic and hydrostatic	
3.1	Understand hydraulic theory	Calculate the force of fluids under pressure using Pascals Law
		Construct a hydraulic lift that can perform a specified amount of work.
3.1	Understand hydrostatic theory	
3.1	Pump identification and operation	
3.1	Motor identification and operation	
3.1	Function and operation of hydraulic valves	
3.1	Electro-hydraulics	
3.1	Cylinder identification and operation	
3.1	Accumulator identification and operation	
3.2	Fluids, transfer components and filtering	
3.3	Maintenance procedures	
3.4	Component repair and replacement	
3.5	Hydraulic schematics	
3.6	Diagnostics	
Power Trains		
4.1	Theory and operation	Research systems in power and technology and explain how they are applied in agriculture
		Calculate the efficiency of work completed by a pulley system to lift an object
		Use ratios to calculate the speed and torque of multiple systems of gears
4.2	Driveshaft function and construction	
4.3	Fundamental theory of hydraulic and pneumatic braking systems	
4.4	Understanding maintenance practices in power trains	
4.5	Power train schematics and flow diagrams	
4.6	Troubleshooting and failure analysis	
Diesel Engines		
5.1	Safety	
5.2	Theory and operation	
5.3	Maintenance practices	
5.4	Component repair	
5.5	Engine subsystems	
5.6	Fuel and governing systems, mechanical and electronic systems	
5.7	Diagnostics	
Air Conditioning/Heating		
6.1	Fundamental knowledge	
6.2	AC systems operation	
6.3	Servicing AC systems	
6.4	Testing, troubleshooting, diagnosing and repairing AC systems	
6.5	Heating system operation	
6.6	Servicing heating systems	
6.7	Pressurized cabs	