

## ACHIEVEMENT LEVEL DESCRIPTORS FOR THE COMPREHENSIVE AGRICULTURE ASSESSMENT

***Please note: Students performing at the Meets Expectations level also meet all standards at the Approaches Expectations level, and students performing at the Exceeds Expectations level also meet all standards at the Approaches Expectations level.***

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### APPROACHES EXPECTATIONS

Students performing at the Approaches Expectations level can recall or list types of ownership for an agribusiness system. They can recall components of agribusiness management and record-keeping principles. They can recall current agricultural laws and policies. These students can also define supply and demand, and recall the components of a distribution channel and of agricultural commodity marketing. They can also define the purpose of an agribusiness plan.

Students performing at this level can identify the origin of animal agriculture and the purposes for which animals were domesticated. They can recall classification and taxonomic principles in animal agriculture. They can define terms related to stages of animal growth and development (e.g. cow, bull, heifer, steer). They can identify cell structures. They can also identify the circulatory, endocrine, digestive, muscular, nervous, respiratory, skeletal, and reproductive systems. These students can recall key terms such as inbred, purebred, line-breeding, and cross-breeding. They can define natural and artificial animal reproduction, and they can define terms related to inheritance (e.g. Punnett square, heterozygous, homozygous, phenotype, and genotype). They can also define terms related to animal performance data (e.g. birth weight, weaning weight). These students can identify characteristics of healthy animals, list environmental conditions that can affect animal health and behavior, and define immunity in animal healthy, such as the use of vaccinations. They can also define wholesale retail cuts for meat selection.

Students who approach expectations can identify food products, processing methods, and common units of measure in food processing. They can identify major food groups and common health problems related to diet. They can identify regulating agencies within food products and processing. They can define agroterrorism. They can define food quality and food product grading standards. These students can list the substances in food chemistry and food processing physics (i.e., water, lipids, proteins, carbohydrates, vitamins, minerals, additives). They can also list food preservation, storage, and handling procedures.

Students performing at this level can define ecosystem, invasive species, habitat, biomes (riparian, wetland, grassland), and niche. They can identify the organization of life in an ecosystem (e.g. trophic levels), and identify cycles found in given ecosystems (e.g. water cycle, energy flow diagram). They can also identify terms associated with legal land descriptions and topographical maps, and define global positioning systems (GPS). These students can define population dynamics, species management, and endangered species. They can identify and define renewable and nonrenewable resources. They can define terms associated with the management techniques of forestry, soil, land use, water, aquatic/marine resources, and air quality. They can also list energy resources. They can identify and/or define governing agencies in natural resources, and define terms related to natural resources (e.g. waste, pollution, and outdoor recreation).

Students who perform at the Approaches Expectations level identify plant systems and define traditional and nontraditional production methods. They can define terms associated with plant systems (e.g. taxonomy, photosynthesis, transpiration, and respiration). They can identify symbols and terms related to safety practices and chemical control methods, and define integrated pest management. They can also define terms related to crop management (e.g. planting, harvesting, storage, irrigation system). These students can define greenhouse management and define terms associated with turf and landscape. They can define soil formation and identify physical characteristics of soil (e.g. sand, silt, and clay).

Finally, students performing at the Approaches Expectations level can identify major events in the history of agricultural mechanics and technical systems. They can list OSHA workplace safety standards (e.g. work environment, personal safety equipment, material safety data sheets, and labels and signs), and identify emergency equipment (e.g. fire extinguishers and eyewash). They can identify hand, power, and specialty tools, and identify proper uses and maintenance procedures for them. These students can identify information on blueprints and working drawings, list items included in a bill of materials, and measure items on a project. They can also define basic terms used in construction. They can list electric safety procedures and identify electrical terms and symbols. They can identify tools, equipment, and materials used in plumbing processes. They can define key terms associated with power and mechanical systems, identify agricultural uses of power systems, and identify safety procedures related to motorized equipment. These students can identify appropriate welding safety protocols and welding processes (e.g. SMAW, GMAW, and Oxy-acetylene).

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## MEETS EXPECTATIONS

Students performing at the Meets Expectations level can define types of ownership for and characteristics of an agribusiness system. They can identify significant markets in global agribusiness systems. They identify data necessary to make agribusiness management decisions and utilize standard record-keeping and accounting principles. They can identify the impact agricultural laws and policies have on current practices in the agricultural industry. These students can also apply the principles of supply and demand, and identify and define the components of a distribution channel and determine the sequence. They can outline and define the components of agricultural commodity marketing. They can also identify and utilize the components of an agribusiness plan.

Students performing at this level can evaluate the economic impact, global significant, and major historical events of the animal agriculture industry. They can identify the parts of the distribution channel in the process and movement of animal products from farm to table, and identify environmental issues relating to animal production. They can classify organisms and sequence taxonomic names in animal agriculture, and identify common characteristics used in classifying breeds. They can identify stages of animal growth and development (e.g. based on visual characteristics, determine sex, age, and species). They can identify and describe the function of cell structures. They can also describe the role and components of the circulatory, endocrine, digestive, muscular, nervous, respiratory, skeletal, and reproductive systems. These students can define key terms such as inbred, purebred, line-breeding, and cross-breeding. They can summarize the process of animal reproduction and define natural and artificial reproduction methods. Given a production scenario, they can complete a Punnett square and identify specific animal performance data (e.g. birth weight, weaning weight). These students can identify characteristics of healthy animals and signs of diseases, parasites, and physiological disorders in animals. They can summarize environmental conditions that can affect animal production and analyze the need for safe, efficient, and industry-recognized standards for handling animals, including interpreting animal behavior. They can also list the principles of immunity in animal healthy (i.e. active/passive, natural/artificial) and list nutrients required for animal health. They can also define key terms

associated with meat quality, selection, and harvesting processes, and differentiate between wholesale and retail cuts.

Students who meet expectations can determine the importance of food products and processing methods. They evaluate the economic impact, global significance, and major historical events of food systems. They can also identify, use, and convert common units of measure in food processing. These students can identify components of a balanced nutritional diet based on USDA recommended daily allowances and analyze the relationship between diet and population health. They can identify principles of food safety and sanitation, including the principles of HACCP. They can define the role of regulating agencies and their responsibilities in maintaining food safety and quality, and identify potential effects of agroterrorism on the food system. These students can identify factors that affect food quality and deterioration and analyze the role of food product grading to provide consistency in food quality. They can identify the role of substances in food chemistry and food processing physics (i.e., water, lipids, proteins, carbohydrates, vitamins, minerals, additives). They can also describe food preservation, storage, and handling procedures.

Students performing at this level can identify the role of organisms in an ecosystem and illustrate cycles found in a given ecosystem (e.g. water cycle, energy flow diagram). They can differentiate between habitats and niches and identify the aspects of riparian and wetland areas. They can identify and describe the role of insects, diseases, and invasive species in ecosystems. They can also apply knowledge associated with legal land descriptions and topographical maps, and apply knowledge of GPS. These students can provide examples of how population dynamics relate to wildlife management, animal adaptations, production agriculture, and human interaction with wildlife areas. They explain the importance of species management, endangered species, and wildlife management ethics. They can differentiate between renewable and nonrenewable resources. They can identify management techniques of forestry, soil, land use, water, aquatic/marine resources, and air quality. They can identify the importance and sources of energy resources. These students can provide examples of issues and regulations related to water, air, land, and outdoor recreation and evaluate the effects waste and pollution on resources. They can also interpret guidelines established by the governing agencies in natural resources.

Students who perform at the Meets Expectations level can provide examples of the importance of plant systems and compare and contrast traditional and nontraditional production trends in plant systems (e.g. conventional vs. organic, GMO vs. non-GMO). They can identify plant production industry segments. They use plant classification systems (e.g. taxonomy, plant use, and life cycle) and identify aspects of plant growth, reproduction, development, anatomy, function of plant parts, and cell structure. They apply knowledge of photosynthesis, transpiration, and respiration to plant production. These students can identify the effect of the plant environment on growth and development, including water, air, light, temperature, and nutrients. They can identify components of an integrated pest management system, demonstrate knowledge of safety practices and chemical control methods, and calculate a chemical application rate. They can also identify elements of crop management (e.g. tools, equipment, facilities) and identify basic irrigation systems. They can define key terms associated with range and pasture management. These students can identify greenhouse function, design, and structure, and identify and compare greenhouse-glazing materials for various applications. They can identify key components of the landscape industry (e.g. design, installation, maintenance, and irrigation). They can identify factors that contribute to soil formation and relate soil characteristics to soil management. They interpret soil surveys and soil test analysis and identify causes and control methods of soil erosion.

Finally, students performing at the Meets Expectations level can sequence major events in the history and advancement of agricultural mechanics and technical systems as they relate to the efficiency of the global agricultural industry. Given a scenario, they can choose applicable OSHA workplace safety standards (e.g.

work environment, personal safety equipment, material safety data sheets, and labels and signs), and locate and use emergency equipment (e.g. fire extinguishers and eyewash). They can select the proper hand, power, or specialty tools for a task. These students can interpret blueprints and working drawings, create a bill of materials for an agricultural mechanics project, follow a procedure list and an order of fabrication, and demonstrate measuring techniques used in project construction. They can also identify construction materials used in agricultural structures (e.g. lumber, hardware, masonry, and roofing materials). They practice electric safety procedures and define electrical terms and symbols. They can distinguish between electrical conductors and insulators. Given a blueprint, these students can select the supplies needed to create an electrical circuit. They can relate tools, equipment, and materials to their proper use in plumbing processes. They can compare and contrast safe and unsafe uses of power systems in agriculture. These students practice appropriate welding safety protocols, and can compare and contrast welding processes (e.g. SMAW, GMAW, and Oxy-acetylene).

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## EXCEEDS EXPECTATIONS

Students performing at the Exceeds Expectations level can define types of ownership for and characteristics of an agribusiness system. They can identify significant markets in global agribusiness systems. They utilize and apply standard record-keeping and accounting principles

to make agribusiness management decisions. They can predict the potential impact that changes in agricultural laws and policies could have on the agricultural industry. These students can also make predictions based on the principles of supply and demand, and utilize agricultural marketing principles to promote products through a distribution channel. They can analyze and predict commodity market trends based on global agriculture. They can also develop and evaluate an agribusiness plan.

Students performing at this level can analyze data based on economic and global significance of animal systems. They can predict future trends in the animal agriculture industry and develop potential solutions for environmental issues related to the industry. They can classify organisms and sequence taxonomic names in animal agriculture, and identify common characteristics used in classifying breeds. They can identify stages of animal growth and development (e.g. based on visual characteristics, determine sex, age, and species). They can identify and describe the function of cell structures. They can also describe the role and components of the circulatory, endocrine, digestive, muscular, nervous, respiratory, skeletal, and reproductive systems. These students can compare how breeding strategies affect production systems. They can compare and contrast the processes of natural and artificial animal reproduction. Given a production scenario, they can use a Punnett square to predict outcomes, and use animal performance data to select animals for breeding (e.g. EPDs, production records, DHIA). Given a scenario, these students can diagnose and suggest treatment options for common diseases in animals. They can design an animal handling system based on industry-recognized standards and perform an animal welfare audit. Given a scenario, they can determine the mechanisms by which immunity is conferred. They can utilize a Pearson square to formulate a balanced ration based on animal performance and herd health. They can also identify species-specific wholesale and retail cuts, and perform yield grade calculations and quality grade evaluations.

Students who exceed expectations can predict future food products and processing trends based on historical events. They can apply multiple conversations of measurement in food processing. These students can develop a balanced nutritional diet based on available resources to promote a healthy lifestyle. They can compare and contrast a country's ability to feed their populations based on available resources. They can identify nutritional solutions to common health problems. They can also develop and/or interpret a HACCP

plan. Given a scenario, they can identify the regulating agency responsible for handling a specific situation. They interpret procedures in response to an agroterrorism threat. These students can identify food quality deterioration causes and measures to prevent them. They can compare the role of substances in food chemistry and food processing physics (i.e., water, lipids, proteins, carbohydrates, vitamins, minerals, additives). They can also apply food preservation, storage, and handling procedures based on a given product.

Students performing at this level can analyze the effect of diseases, native insects, and the introduction of an invasive species in the balance and health of an ecosystem. They can also analyze a scenario using GPS. These students can analyze population dynamics related to wildlife management, animal adaptations, production agriculture, and human interaction with wildlife areas. They can describe the process of making resource management decisions. Given a scenario, these students can determine potential effects of waste and pollution on resources and the role of governing agencies, and analyze the use of natural resources for outdoor recreation.

Students who perform at the Exceeds Expectations level can sequence plant production industry segments. Given a scenario, they can use evidence to communicate the selection of a production method in plant systems. Given a scenario, these students can describe how to manipulate plant growth using knowledge of photosynthesis, transpiration, and respiration in plant production. These students can interpret an integrated pest management plan. Given a scenario, they can recommend appropriate safety practices and chemical control methods. They can also recommend a crop management technique for a specific scenario. They can define key terms associated with range and pasture management. Given a scenario, these students can make recommendations for greenhouse design, structure, and materials. Given a scenario, they can make recommendations for a landscape and/or turf situation. Given a scenario, they can analyze and make recommendations based on soil surveys and soil test analysis, and recommend control methods to reduce soil erosion.

Finally, students performing at the Exceeds Expectations level can sequence major events in the history and advancement of agricultural mechanics and technical systems as they relate to the efficiency of the global agricultural industry. Given a scenario, they can choose applicable OSHA workplace safety standards (e.g. work environment, personal safety equipment, material safety data sheets, and labels and signs), and locate and use emergency equipment (e.g. fire extinguishers and eyewash). They can select the proper hand, power, or specialty tools for a task. These students can develop a procedure list and an order of fabrication. Given a scenario, they can also select appropriate construction materials used in agricultural structures (e.g. lumber, hardware, masonry, and roofing materials). Given a scenario, they can create an electrical circuit and identify proper wiring techniques. They can select tools, equipment, and materials to an identified plumbing process. They can compare and contrast safe and unsafe uses of power systems in agriculture. Given a scenario, these students can select the appropriate welding processes (e.g. SMAW, GMAW, and Oxy-acetylene).