Goodheart-Willcox Publisher

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Goodheart-Willcox Publisher Correlation of *Principles of Agriculture, Food, and Natural Resources* ©2017 to Tennessee Department of Education Standards Course: Agriscience (5957)

	STANDARD	CORRELATING PAGES
	Agriscience Investigation and Overview	
1	Synthesize research on the historical importance and purpose of agriculture and agriculture organizations, identifying major events, opportunities and technological developments influenced by agriscience theories and practices.	4–13, 16–29, 50–61
2	Identify and review general common laboratory safety procedures including but not limited to prevention and control procedures in agriscience laboratories. Incorporate safety procedures and complete safety test with 100 percent accuracy.	158–172, 176–199
	Agriculture and Society	
3	Gather and analyze information from multiple authoritative sources, such as the United States Bureau of Labor Statistics, United States Department of Agriculture website and Tennessee labor data, to summarize the economic impact of the agricultural industry. Describe major career trends in Tennessee, the United States, and worldwide.	8–13, 117–137
4	Determine how a Supervised Agricultural Experience (SAE) program functions as a method to apply concepts of the scientific investigation process (i.e. conducting an Agriscience Fair project). Compare and contrast the types of SAEs as related to their importance to the scientific investigation process.	98–114, 210–217
5	Conduct a research project or literature review exploring a specific social and/or political impact on the agriculture industry at the local, state, national, or international level. For example, explore how the increase in availability of genetically modified organisms has impacted crop production and the green movement. Summarize findings in an informative essay. Revise, edit	4–13, 210–217, 232–247

	or rewrite as needed to strengthen writing.	
Fundamentals of Environmental Systems		
6	Describe the biogeochemical cycles impacting the agriculture industry by creating illustrative models and informative texts for the following: a. Carbon cycle b. Nitrogen cycle c. Oxygen cycle d. Water cycle	14.2: 857–874 a.) 867–873 b.) 864–867 c.) 688–689, 748–750, 846 d.) 858–864
7	Critique the dynamics of biomass and energy flow in ecosystems by analyzing the major components of a food chain. Analyze the structure of the relationships among the concepts of carrying capacity, species populations, and organism interactions within multiple ecosystems and natural habitats.	307–308, 842–853, 892–896
8	Produce an informative essay to distinguish between types of pollution and their sources, defining and applying ecology- and conservation-specific terminology. Compare and contrast important connections between pollution and its effects on environmental conditions (i.e. water, soil and air), animal populations, and plant populations.	971–974, 1030–1039
Fundamentals of Cell Biology		
9	Compare basic plant and animal cell biology, including structure and function. Create a visual representation that identifies cellular organelles and major cell processes.	736–753
10	Compare and contrast the roles of proteins, carbohydrates, lipids, and nucleic acids as they relate to cell growth and cell reproduction.	483–484, 481–487, 750–751
Fundamentals of Genetics and Heredity		
11	Determine the significance of and relationships between genes, chromosomes, proteins, and hereditary traits. Analyze the role of genes in determining genetic make-up, gender, and hereditary characteristics. Using systems of equations, explain the variation and distribution of genotypes and phenotypes expressed in plants and animals.	234–235, 237, 242–246, 510, 529, 556, 750, 753

Fundamentals of Anatomy and Physiology		
12	Using graphic illustrations and supporting text, identify and describe major animal body systems (skeletal, muscular, respiratory, digestive, nervous, circulatory, respiratory, and reproductive) to establish a basic knowledge of their purpose, structure, and function.	512, 515, 532, 549, 551–552, 581–582, 608–609, 611, 621–622, 631–632, 634
Chemistry of Animal Digestion		
13	Classify the types of digestive systems in domestic animals, and compare and contrast their anatomical and physiological differences. Synthesize research on animal nutrition (using academic journals or publications from Tennessee Extension Service) to produce an informative narrative, including defining and applying nutrition specific terminology, to examine the stages of digestion and associated processes.	512–513, 549, 582, 608–609, 620
14	Use the periodic table and the atomic chart to compare differences between ionic and covalent bonding as related to digestion. Demonstrate an understanding of the interdependence of the complex chemical and biological processes involved in the digestion process including, but not limited to, the following: elements, compounds, mixtures, and acids.	483, 491–496
15	Research the relationship between metabolism, energy, and nutrition. Evaluate life stage and activity level to determine the nutritional needs of animals. Differentiate types of rations to maximize animal performance.	480–491
Fundamentals of Plant and Soil Science		
16	Apply concepts related to the basic cellular and biochemical processes in plants to demonstrate the following: a. Create a graphic illustration of the parts and functions of plant cells b. Use quantitative reasoning to balance chemical equations related to plant processes c. Interpret the role of physics within the cohesion-tension theory and its significance	a.) 738–739, 742 b.) 749–750 c.) 739, 1060 d.) 742, 748–749

	to plant life d. Examine the roles of photopigments and the effects of different colors of light on plant growth	
17	Formulate a hypothesis about the correlation between plant nutrient deficiencies and soil composition. Conduct basic soil analysis to determine the chemical elements and nutritional levels available in soils essential for plant growth. Draw conclusions about the ability of soils to meet the nutritional requirements of plants.	929–945
Reproductive Systems		
18	Research and develop illustrative models that compare and contrast the reproductive structures of plants, drawing out key differences between sexual and asexual reproduction processes.	750–754
19	Describe the structure and function of different seed components and summarize their roles in plant reproduction and propagation.	744, 752
20	Describe the structures and functions of the male and female animal reproductive systems. Compare and contrast the differences of the reproductive systems between small and large animal species.	243–246, 510, 529, 582, 597, 604, 618, 620, 629
Principles of Power and Energy		
21	Apply fundamental principles of physics as they relate to agricultural power and technology concepts in order to demonstrate the following: a. Analyze the relationship between speed, distance, and time b. Relate the types of simple machines to the law of machines and mechanical advantages c. Specify groups, sources, and forms of energy d. Analyze the principle of heat energy and describe the way heat travels	a.) 222, 379–383 b.) 222, 380, 381 c.) 222, 298–317 d.) 222, 305–306 e.) 222 f.) 222, 298–319

	e. Explain the law of conservation of energy f. Explain the production of energy and relate it to the invisible light spectrum	
Fundamentals of Electricity		
22	Identify different methods by which electrical energy can be produced. Discuss the safety hazards involved in each method as well as prevention and control methods relevant to electrical power supplies. Justify the use of different precautions for the prevention or management of electrical hazards and evaluate the efficacy of the prevention measures.	167–170, 182–185
23	Utilize the appropriate instruments needed to calculate and measure voltage, amperage, resistance, and wattage.	
Fundamentals of Engines		
24	Apply basic principles of thermodynamics to analyze the function of major components of gasoline and diesel fuel engines.	380, 381
25	Using quantitative reasoning and employing appropriate unit conversions, calculate horsepower and thermal efficiency in internal combustion engines by creating systems of equations that describe numerical relationships.	381, 419–426, 427, 428–432