



TEST DESIGN AND FRAMEWORK

TEST DESIGN

Agricultural Education

The **Agricultural Education** assessment consists of **two tests**. Each test contains a section with selected-response questions and a section with constructed-response assignments. Each section counts for a percentage of your total test score. The areas of content assessed by each test, the approximate number of selected-response questions and constructed-response assignments in each content area, and the percentage of your total test score derived from each test section are shown in the tables below. Further information regarding the content included in each subarea can be found in the test framework.

■ Test I (Test Code 040)

Subareas:	Objectives	Approximate Number of Selected-Response Questions	Constructed-Response Assignments
➤ Foundations of Agriculture and Agricultural Education	0001–0004	27	1
➤ Agricultural Business Management, Economics and Marketing	0005–0006	13	1
➤ Agricultural Mechanics and Technology	0007–0009	20	
TOTAL		60	2
Percentage of Test Score		80%	20%

■ Test II (Test Code 041)

Subareas:	Objectives	Approximate Number of Selected-Response Questions	Constructed-Response Assignments
➤ Animal Science	0010–0012	16	1
➤ Plant Science	0013–0018	33	1
➤ Environmental Science, Natural Resource Management, and Forestry	0019–0020	11	
TOTAL		60	2
Percentage of Test Score		80%	20%



Georgia Assessments for the
Certification of Educators®

TEST DESIGN AND FRAMEWORK

TEST FRAMEWORK

Agricultural Education

FOUNDATIONS OF AGRICULTURE AND AGRICULTURAL EDUCATION

0001 Understand the foundations of agricultural science.

For example:

- demonstrating knowledge of the scope and importance of the agricultural industry on the state, national, and international levels
- demonstrating knowledge of major areas of research in agricultural science
- demonstrating knowledge of the use and application of science and technology (e.g., scientific methods and principles) in the agricultural industry
- applying knowledge of math, reading, and writing skills used in various contexts within the agricultural industry
- applying knowledge of record keeping and computer skills used in various contexts within the agricultural industry
- applying knowledge of management skills used in various contexts within the agricultural industry
- demonstrating knowledge of important events and developments in the history of agriculture and agricultural education



0002 Understand career development in agricultural education.

For example:

- identifying the knowledge, skills, and requirements necessary for success in various agricultural careers
- demonstrating knowledge of employer expectations, appropriate work habits, and personal characteristics necessary for a successful career in the agricultural industry
- identifying goals and purposes of supervised agricultural experiences and characteristics of different types of supervised agricultural experiences
- applying knowledge of strategies for coordinating supervised agricultural experiences and for assisting students in planning, selecting, managing, and assessing their supervised agricultural experiences
- demonstrating knowledge of the total program approach in agricultural education and the relationship among classroom and laboratory learning, supervised agricultural experiences, and the National FFA Organization (FFA)
- identifying the roles and purposes of the Georgia Young Farmers Association (GYFA), FFA alumnae, the National Association of Young Farmers, and the Georgia Vocational Agricultural Teachers Association in agricultural education

0003 Understand the role of the FFA as an intracurricular organization in agricultural education.

For example:

- demonstrating knowledge of the purposes (e.g., assisting students in developing leadership, communication, citizenship, and competitive skills) of FFA activities
- demonstrating knowledge of characteristics and organizational structures of the FFA
- demonstrating knowledge of the roles and responsibilities of FFA advisors
- identifying effective strategies for developing a basic FFA Program of Activities (POA)
- demonstrating knowledge of important events and developments in the history of agriculture, agricultural education, and the FFA

0004 Understand safety in agricultural education.

For example:

- identifying potential hazards in the classroom, in the laboratory, and in supervised agricultural experiences
- demonstrating knowledge of occupational safety practices in agriculture and of strategies for instructing students in the safe use of agricultural tools, materials, equipment, and livestock
- identifying effective strategies for incorporating safety training and for developing and implementing safety plans into the agricultural education program
- recognizing procedures for safe use, storage, and disposal of hazardous materials (e.g., pesticides, oil)
- identifying sources of safety-related information



AGRICULTURAL BUSINESS MANAGEMENT, ECONOMICS, AND MARKETING

0005 Understand agricultural business management.

For example:

- demonstrating knowledge of characteristics and purposes of different types of business organizations (e.g., partnerships, corporations, cooperatives)
- applying knowledge of steps for organizing and starting an agricultural business in a selected area (e.g., conducting a feasibility study, developing a business plan)
- identifying business management functions (e.g., planning, organizing, directing, controlling) and skills (e.g., entrepreneurship skills, leadership skills) needed for successful agricultural business management
- applying knowledge of methods for developing and analyzing short-range and long-range business management plans for agricultural businesses
- applying knowledge of principles of and procedures for managing and protecting financial resources and for ensuring the most efficient use of capital (e.g., budgeting, accounting, keeping and using financial records, using credit, managing risk)
- demonstrating knowledge of ethics as applied to agricultural businesses

0006 Understand agricultural economics, marketing, and sales.

For example:

- demonstrating knowledge of basic economic principles (e.g., risk, supply and demand) as applied to agricultural businesses
- demonstrating knowledge of basic principles of and strategies for marketing agricultural products (e.g., identifying target markets, displaying and pricing products)
- identifying factors that affect world agricultural trade
- demonstrating knowledge of the influence of international markets and international trade agreements on U.S. agriculture
- identifying factors that influence the pricing and sale of agricultural goods and services
- demonstrating knowledge of proper sales techniques, methods for closing a sale and overcoming purchase obstacles, and procedures for completing sales-related paperwork



AGRICULTURAL MECHANICS AND TECHNOLOGY

0007 Understand basic agricultural power systems and equipment.

For example:

- demonstrating knowledge of the types (e.g., diesel, two-cycle, four-cycle), principles, characteristics, and components of internal combustion engines
- demonstrating knowledge of procedures for servicing, maintaining, and overhauling small engines and small-engine systems (e.g., fuel system, electrical system)
- demonstrating knowledge of procedures for safe operation and maintenance of agricultural machinery

0008 Understand agricultural wood and metal fabrication.

For example:

- applying knowledge of basic project planning and techniques and of measurement methods used in wood and metal fabrication
- demonstrating knowledge of types, properties, and uses of materials used in wood and metal fabrication
- demonstrating knowledge of types, characteristics, uses, and safe operation of tools and equipment used in wood and metal fabrication
- demonstrating knowledge of how to safely perform basic woodworking and metalworking procedures

0009 Understand agricultural construction.

For example:

- applying knowledge of principles of building design, techniques of construction, and methods of evaluating agricultural structures for various applications
- applying knowledge of construction planning and estimating skills and skills used in interpreting drawn plans
- demonstrating knowledge of carpentry and finishing skills (e.g., painting) and of principles, methods, tools, and materials relevant to the construction of agricultural structures
- demonstrating knowledge of principles and applications of electrical power and of skills, principles, methods, tools, and materials relevant to the design, management, installation, and maintenance of electrical systems used in agricultural construction
- demonstrating knowledge of principles of and applications related to plumbing and irrigation
- demonstrating knowledge of principles of and applications related to concrete and masonry

ANIMAL SCIENCE

0010 Understand classification, anatomy, physiology, and genetics of animals.

For example:

- identifying basic characteristics and uses of various species (e.g., horses, cattle, swine, sheep, rabbit, poultry species) and breeds of animals
- demonstrating knowledge of the anatomy and physiology of animals and their relationship to animal production and management
- demonstrating knowledge of underlying growth processes and stages of growth in animals
- applying knowledge of basic principles of animal genetics and selective breeding in animal production
- applying knowledge of basic principles of bioengineering and biotechnology in animal production
- analyzing basic principles of animal reproduction and their application to breeding practices used in animal production
- demonstrating knowledge of principles of and procedures for evaluating and selecting animals

0011 Understand animal production and management.

For example:

- demonstrating knowledge of standard and alternative methods for animal production and management (e.g., large animals, dairy, specialty animals, poultry, aquaculture)
- demonstrating knowledge of animal nutrition (e.g., nutritional requirements, nutrient sources, digestive capabilities, deficiency symptoms) and feeding practices (e.g., composition, classification, nutritional value of feeds; feed additives)
- identifying types, symptoms, and life cycles of parasites that attack animals and methods for their prevention, treatment, and control
- identifying types, causes, and symptoms of common infectious and noninfectious diseases of animals and methods for their prevention, treatment, and control
- demonstrating basic knowledge of fisheries science and aquaculture

0012 Understand animal facilities and consumer and environmental issues in animal production and management.

For example:

- demonstrating knowledge of types, characteristics, and purposes of animal facilities (e.g., barns, feedlots, confinement housing) and appropriate environmental conditions (e.g., temperature, lighting) for housing various animals
- analyzing environmental concerns in animal production (e.g., managing wastes, maintaining sanitation)
- identifying consumer concerns about animal production and legal and ethical issues relating to animal welfare
- applying knowledge of principles, techniques, skills, and equipment used in processing, storing, and inspecting animal products (e.g., meat, eggs, milk, fiber) to ensure safe, efficient, and economical delivery of these products to the consumer
- analyzing effects of government rules and regulations on the animal production industry

PLANT SCIENCE

0013 Understand principles of soil science.

For example:

- demonstrating knowledge of the formation of soil and the classification, properties, composition, and characteristics of soil and of how they relate to plant growth
- applying knowledge of procedures for performing and interpreting basic soil tests and for evaluating suitability of different types of soil for various crops
- demonstrating knowledge of characteristics and uses of different types (e.g., organic, inorganic), formulations (e.g., NPK), and forms (e.g., liquid, granular) of fertilizers, soil amendments (e.g., lime, organic matter), and other components of commercial plant-growth systems
- applying basic knowledge of soil management practices (e.g., tillage, seedbed preparation, crop rotation, drainage, irrigation) and soil conservation measures

0014 Understand plant classification, anatomy, and physiology.

For example:

- demonstrating knowledge of plant classification and characteristics of major plant groups
- analyzing the importance of plants to life, the economy, and the environment
- demonstrating knowledge of the forms, functions, and processes of plant cells, vegetative structures, and organ systems
- demonstrating knowledge of processes of plant growth and environmental factors (e.g., nutrients, light, water) that affect growth and of how these factors are manipulated in plant production

0015 Understand plant reproduction and genetics.

For example:

- applying knowledge of principles of plant genetics, selective breeding, and hybridization to production of crops
- demonstrating knowledge of structures and processes of asexual and sexual reproduction
- demonstrating knowledge of methods and techniques of plant propagation (e.g., seeds, grafting, division)
- applying knowledge of basic principles of bioengineering and biotechnology to plant production

0016 Understand crop production and management.

For example:

- identifying types (e.g., grain, sugar, forage, pasture, oil, fruit, nut, vegetable, fiber) and uses of major crops grown in Georgia
- identifying types and characteristics of crop production practices (e.g., planting, tilling, irrigating, harvesting), including hydroponics
- demonstrating knowledge of how plants use nutrients and of how to recognize, prevent, and treat nutrient deficiencies in crops
- demonstrating knowledge of the economic effects of weeds, diseases, and insect pests on crop production and methods for recognizing, preventing, and controlling (e.g., use of chemicals, integrated pest management) common weeds, diseases, and insect pests
- applying knowledge of safe practices (e.g., safe handling, storage, and disposal of agricultural chemicals) in crop production and management
- analyzing effects of government rules and regulations on crop production enterprises

0017 Understand basic principles and concepts of nursery production and landscape design and management.

For example:

- identifying types, characteristics, and uses of flowers, shrubs, trees, turfs, and other ornamental plants grown in Georgia
- applying knowledge of types, characteristics, and appropriate uses of growing media used in nurseries, turf farms, and landscapes
- demonstrating knowledge of methods for selecting, scheduling, propagating, fertilizing, irrigating, harvesting, and transporting nursery, turf, and landscape crops
- demonstrating knowledge of methods for identifying, selecting, maintaining, and safely using structures, equipment, tools, materials, and supplies used in nurseries and in landscaping
- applying knowledge of methods for identifying and controlling pests, diseases, and weeds in nurseries, turfs, and landscapes
- demonstrating knowledge of methods for designing, establishing, and maintaining landscapes
- demonstrating knowledge of methods for producing, preparing, receiving, storing, marketing, and pricing nursery and turf crops and landscape designs

0018 Understand basic principles and concepts of floriculture and floral design.

For example:

- identifying types, characteristics, and uses of flowers and plants in floriculture and floral design
- applying knowledge of types, characteristics, and appropriate uses of growing media in floriculture
- demonstrating knowledge of methods for selecting, scheduling, propagating, fertilizing, irrigating, harvesting, and transporting floricultural crops
- demonstrating knowledge of methods for identifying, selecting, maintaining, and safely using structures, equipment, tools, materials, and supplies used in floriculture and the florist industry
- applying knowledge of methods for identifying and controlling pests, diseases, and weeds in floricultural production
- demonstrating knowledge of methods for producing, preparing, receiving, storing, marketing, and pricing floricultural crops (e.g., flowers, plants) and floral designs

ENVIRONMENTAL SCIENCE, NATURAL RESOURCE MANAGEMENT, AND FORESTRY

0019 Understand ecological principles, natural resource management, and the relationship of agriculture to the environment.

For example:

- demonstrating knowledge of basic ecological principles (e.g., niche, ecosystem, water and nutrient cycles) and their application to agriculture
- analyzing the effects of agriculture on the environment and the advantages and disadvantages of different production systems (e.g., sustainable agriculture, monoculture)
- demonstrating knowledge of proper management of agricultural waste products and chemicals and of practices used to protect soil, air, and water quality
- demonstrating knowledge of types, characteristics, and uses of renewable and nonrenewable natural resources (e.g., energy, soil, water, wildlife, habitat) and concepts and methods for their conservation and management
- applying knowledge of field skills used in natural resource conservation and management (e.g., analyzing field data for soil and water conservation plans using Global Positioning Systems (GPSs); reading maps, aerial photographs, and legal land descriptions)
- demonstrating knowledge of ethical issues (e.g., stewardship) and environmental agencies, organizations, laws, and regulations related to agriculture and the environment

0020 Understand basic principles and concepts of forestry.

For example:

- demonstrating knowledge of types, characteristics, and uses of forests, tree species, and forest products and the importance of forests to the environment and the economy
- applying knowledge of principles and methods for evaluating and managing forests for efficient production and for maintaining a healthy forest (e.g., controlling forest insects, diseases, and undesirable trees)
- demonstrating knowledge of reforestation principles and methods (e.g., selecting and preparing a site, procuring seeds and seedlings, planting)
- demonstrating knowledge of characteristics of wildfires and methods of fire prevention and control (e.g., prescribed burning, clear-cutting firebreaks)
- applying knowledge of field skills used in forestry (e.g., measuring standing timber, evaluating timber stands, reading maps, determining boundaries of forest areas, cruising timber, measuring forest products)
- identifying methods of harvesting, transporting, and marketing forest products