



## AGRICULTURAL MECHANICS STUDY GUIDE

Agricultural Mechanics (Technical Agriculture Operations) certifies that individuals have a knowledge and skill set applicable to the mechanics sector of the agricultural industry including mechanical operations, welding, small engine maintenance and repair, planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

The certification standards for the Agricultural Mechanics exam are based on the standards and benchmarks taught in the Florida's Agricultural Mechanics program at the secondary level. Each standard is weighted based on industry needs and feedback and are noted below. The number of questions per standard is determined by the industry weight. A complete listing of the standards and corresponding benchmarks are available from the Florida Department of Education.

Standard	Description	Resource	Weight
13	Practice personal, equipment, and shop safety	Agricultural Mechanics, 6th Edition: Section 2, Units 3-6	7%
14	Select and use hand and power tools	Agricultural Mechanics, 6th Edition: Section 3, Units 7-13	7%
15	Install simple electrical circuits	Agricultural Mechanics, 6th Edition: Section 11, Units 33-36	9%
16	Plan, draw, and construct a project	Agricultural Mechanics, 6th Edition: Section 5, Units 18-20	5%
17	Perform basic plumbing procedures	Agricultural Mechanics, 6th Edition: Section 12, Unit 37	6%
18	Mix and pour concrete and use masonry materials	Agricultural Mechanics, 6th Edition: Section 13, Unit 10	8%
19	Construct and maintain agricultural structures	Agricultural Mechanics, 6th Edition: Section 14, Units 41-43	6%
20	Evaluate the importance of the food and fiber system to understand the impact on global economy	Agriscience Fundamentals & Applications, 5th Edition: Unit 1, Unit 2 & Unit 4	1%
21	Examine the scope of career opportunities in and the importance of agriculture to the economy	Agriscience Fundamentals & Applications, 5th Edition: Unit 1, Unit 2 & Unit 4	2%
22	Demonstrate employability skills	Agriscience Fundamentals & Applications, 5th Edition: Unit 6	2%
26	Demonstrate electric and gas welding	Agricultural Mechanics, 6th Edition: Sections 7-8, Units 23-27	9%
27	Service and maintain small gasoline engines	Agricultural Mechanics, 6th Edition: Section 10, Units 30-32	9%
28	Perform preventive maintenance, checks, and services for agricultural equipment	Agricultural Mechanics, 6th Edition: Section 10, Units 31-32; Section 12, Unit 39	9%
29	Perform minor repair on an irrigation system	Agricultural Mechanics, 6th Edition: Section 12, Units 38	6%
30	Discuss the role of refrigeration in agriculture	"Refrigeration 101" by Walker (pdf); "The Refrigeration System" by Honeywell (pdf)	1%
31	Demonstrate knowledge of new and emerging technologies in agriculture	Agriscience Fundamentals & Applications, 5th Edition: Unit 8, Unit 32 & Unit 34	6%

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32	Explain the components of the American business system	Agriscience Fundamentals & Applications, 5th Edition: Unit 36	3%
33	Investigate agricultural cooperatives structure and function	Agriscience Fundamentals & Applications, 5th Edition: Unit 36	2%
34	Apply basic financial-management skills	Agriscience Fundamentals & Applications, 5th Edition: Unit 36	2%

## Technical Agriculture Operations 2

### STANDARD 13

7 QUESTIONS

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Students should be familiar with personal, equipment, and shop safety.

*Sample Question: Approximately what yearly percentage of farm accidents is related to machinery?*

Students should be familiar with OSHA and its safety regulations.

*Sample Question: How often should a fire extinguisher be inspected?*

### STANDARD 14

7 QUESTIONS

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Students should know the purpose and use of various hand and power tools.

*Sample Question: How do power tools differ from hand tools?*

Students should know how to use various hand and power tools.

*Sample Question: When electrical tools are operated in a wet environment, what should be used to prevent electrical shock?*

### STANDARD 15

9 QUESTIONS

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Students should know and understand how to install simple electrical circuits.

*Sample Question: What type of switch would permit a light to be controlled by two switches, each on opposite sides of the room?*

### STANDARD 16

5 QUESTIONS

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Students should know how to draw, plan, and construct a project.

*Sample Question: Prior to purchasing the supplies for a project, what document should the builder first prepare?*

Students should be familiar with proper tools to construct a project.

*Sample Question: What is a protractor used for?*

### STANDARD 17

6 QUESTIONS

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Students should be able to perform basic plumbing procedures.

*Sample Question: How are pipes usually sized?*

Students should be familiar with the tools used for basic plumbing procedures.

*Sample Question: What is a “coupling” used for?*

## **STANDARD 18**

## **8 QUESTIONS**

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Students should be familiar with pouring and mixing concrete.

*Sample Question: What term is associated with a mixture of sand, Portland cement, water, and finishing lime?*

Students should be familiar with masonry materials.

*Sample Question: What type of finish is adequate to produce a rough surface to improve footing and traction?*

## **STANDARD 19**

## **6 QUESTIONS**

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Students should be familiar with constructing agricultural structures.

*Sample Question: When building livestock facilities, where on the farmstead should those buildings be constructed?*

Students should be familiar with maintaining agricultural structures

*Sample Question: What is the term use to describe the material used to support flooring?*

## **STANDARD 20**

## **1 QUESTION**

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Students should be familiar with the importance of the food and fiber system.

*Sample Question: Approximately how much money does the agriculture industry bring into the U.S. economy yearly?*

Students should be familiar with the importance of the food and fiber system on the global economy.

*Sample Question: Approximately how much money does the agriculture industry bring into the U.S. economy yearly?*

## **STANDARD 21**

## **2 QUESTIONS**

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Students should be familiar with the scope of career opportunities in agriculture.

*Sample Question: Approximately what percent of America’s population are farmers?*

Students should be familiar with the importance of agriculture to the economy.

*Sample Question: Approximately how many people does the average American farmer feed?*

**STANDARD 22**

**2 QUESTIONS**

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Students should be able to display employability skills.

*Sample Question: What document is almost always required at a job interview?*

## Technical Agriculture Operations 3

### STANDARD 26

**9 QUESTIONS**

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Students should be able to discuss and demonstrate correct electric and gas welding techniques.

*Sample Question: As part of the procedures to create a proper weld, where should the tip of the electrode be placed?*

### STANDARD 27

**9 QUESTIONS**

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Students should be able to explain how small gas engines operate.

*Sample Question: On a four-cycle engine, a cycle begins with the piston moving in which direction?*

Students should be able to maintain and service small gas engines.

*Sample Question: In an engine, which system generally needs the most maintenance?*

### STANDARD 28

**9 QUESTIONS**

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Students should be able to perform preventive maintenance, checks, and services for agricultural equipment.

*Sample Question: When having trouble with equipment, what should you first refer to?*

### STANDARD 29

**6 QUESTIONS**

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Students should be able to perform minor irrigation repairs.

*Sample Question: Before installing an irrigation system, what agency should be contacted?*

Students should be familiar with basic irrigation components.

*Sample Question: "Spaghetti tubes" are commonly associated with what type of irrigation system?*

### STANDARD 30

**1 QUESTION**

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Students should be familiar with the basic parts of a refrigeration system.

*Sample Question: Based on how it operates, what does the compressor in a refrigeration system most resemble?*

### STANDARD 31

**6 QUESTIONS**

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Students should be familiar with new power technologies.

*Sample Question: Which technology uses sunlight to supply energy?*

Students should be familiar with the management of existing power sources.

*Sample Question: What is one of the most popular energy management issues?*

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## STANDARD 32

## 3 QUESTIONS

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Students should be able to describe the five basic ways American business is organized. This includes:

- compare and contrast each method of doing business
- list advantages and disadvantages for each method of doing business

*Sample Question: What does the distribution function of business involve?*

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## STANDARD 33

## 2 QUESTIONS

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Students should be able to explain the definition of a cooperative and identify examples of cooperatives.

*Sample Question: Which type of cooperative receives products from its members and then resells those products for the best possible price?*

Students should be able to distinguish between the main types of cooperatives and their functions.

*Sample Question: What are the main types of cooperatives?*

Students should be able to list benefits of cooperatives.

*Sample Question: What is an advantage of selling products such as milk through a cooperative?*

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## STANDARD 34

## 2 QUESTIONS

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Students should be familiar with the purpose and use of the following agribusiness financial records:

- balance sheets
- budgets
- cash-flow statements
- income statements
- inventory reports
- profit and loss statements

*Sample Question: What is the term for a financial document that records the amount of product kept on hand, how many were sold, each item's cost, total sale, and profit?*

Students should be able to explain the purposes and structures of contracts, leases, deeds, and insurance policies for an agribusiness.

*Sample Question: How are the payments for an amortized loan structured?*

Students should know the advantages and disadvantages of agribusiness entrepreneurship.

*Sample Question: What is a major disadvantage of owning your own agribusiness?*