Individual Test Item Specifications

9540310- Electronics Fundamentals 1

2015

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Table of Contents

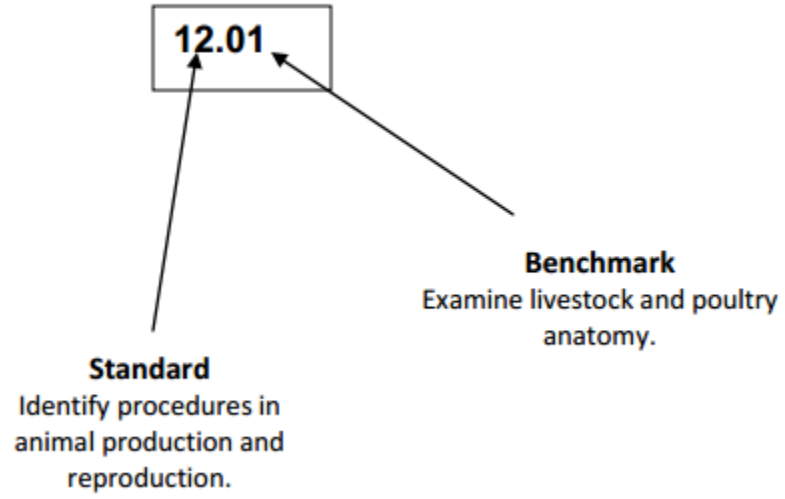
I. Guide to the Individual Benchmark Specifications

Content specific guidelines are given in the *Individual Benchmark Specifications* for each course. The *Specifications* contains specific information about the alignment of items with the Florida Standards. It identifies the manner in which each benchmark is assessed, provides content limits and stimulus attributes for each benchmark, and gives specific information about content, item types, and response attributes.

Benchmark Classification System

- Each Career and Technical Education course has its own set of course standards. The benchmarks are organized numerically, with two numbers separated by a decimal point. The first number is the standard number, and the second number is the benchmark number. You will see these numbers on the Item Specifications for each course.

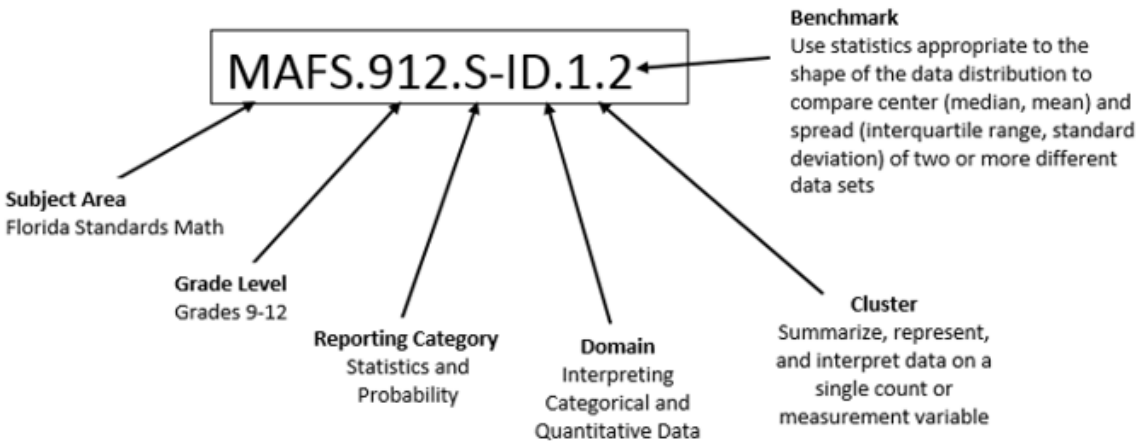
An example, from Agritechnology 1:



The image above describes the components of a Career and Technical Education Standard and Benchmark classification system.

Each MAFS benchmark is labeled with a system of letters and numbers.

- The four letters in the *first position* of the label identify the **Subject**.
- The number(s) in the *second position* represents the **Grade Level**.
- The letter(s) in the *third position* represents the **Category**.
- The number in the fourth position shows the **Domain**.
- The number in the *fifth position* identifies the **Cluster**.
- The number in the last position identifies the specific **Benchmark**.



The image above describes the components of a Florida Standard and Benchmark classification system.

Definitions of Benchmark Specifications

The *Individual Benchmark Specifications* provides standard-specific guidance for assessment item development for the Florida Department of Education Career and Technical Education item banks. For each benchmark assessed, the following information is provided.

Reporting Category	is a grouping of related benchmarks that can be used to summarize and report achievement.
Standard	refers to the standard statement presented in the Florida Standards.
Benchmark	refers to the benchmark statement presented in the Florida Standards. In some cases, two or more related benchmarks are grouped together because the assessment of one benchmark addresses another benchmark.
Item Types	are used to assess the benchmark or group of benchmark.
Cognitive Complexity	ideal level at which item should be assessed.
Benchmark Clarifications	explain how achievement of the benchmark will be demonstrated by students. In other words, the clarification statements explain what the student will do when responding to questions.
Content Limits	define the range of content knowledge and that should be assessed in the items for the benchmark.
Stimulus Attributes	define the types of stimulus materials that should be used in the items, including the appropriate use of graphic materials and item context or content.
Response Attributes	define the characteristics of the answers that a student must choose or provide.
Content Focus	addresses the broad key terms and concepts associated with the examples found in the standards, benchmarks, or benchmark clarifications.
Sample Items	are provided for each type of question assessed. The correct answer for all sample items is provided.

II. Individual Benchmark Specifications

Standard	04.0 Demonstrate proficiency in soldering basic laboratory practices--The student will be able to:
Benchmark	4.05 Demonstrate acceptable soldering techniques.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	M, H
Benchmark Clarification	The student will demonstrate proper soldering techniques.
Content Focus	Rosin core solder, flux
Content Limits	Items should be limited to avionics technology for civilian craft.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Cut two six inch pieces of wire from the spool. Strip one end of each wire and demonstrate to your instructor proper soldering technique.

Standard	04.0 Demonstrate proficiency in soldering basic laboratory practices--The student will be able to:
Benchmark	4.06Demonstrate acceptable desoldering techniques.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	M, H
Benchmark Clarification	The student will demonstrate proper desoldering techniques.
Content Focus	Desoldering braid
Content Limits	Items shoudl be limited to avionics technology for civilian craft
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Using the circuit board provided, demonstrate to your instructor how to desolder one of the joints.

Standard	04.0 Demonstrate proficiency in soldering basic laboratory practices--The student will be able to:
Benchmark	4.07 Demonstrate electrostatic discharge (ESD) safety procedures.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	M, H
Benchmark Clarification	The student will demonstrate electrostatic discharge (ESD) safety procedures.
Content Focus	ESD, grounding strap
Content Limits	Items should be limited to avionics technology for civilian craft.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	At the workstation there is a printed circuit board. Demonstrate to your instructor proper procedure to eliminate electrostatic discharge (ESD).

Standard	05.0 Demonstrate proficiency in basic direct current (DC) circuits--The student will be able to:
Benchmark	5.03 Identify sources of electricity.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will identify sources of electricity.
Content Focus	Piezoelectric, electromechanical, induction, kinetic, static, chemical energy
Content Limits	Items should not include hands on activities or labs.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which of the following electrical sources uses pressure? A. battery B. generator C. piezoelectric D. static Answer C

Standard	05.0 Demonstrate proficiency in basic direct current (DC) circuits--The student will be able to:
Benchmark	5.04 Define voltage, current, resistance, power and energy.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will define voltage, current, resistance, power, and energy.
Content Focus	Ohm's Law, Watt's Law, voltage, electromotive force, resistance, Ohms, current, Amperes, watt, potential difference
Content Limits	Items should not include hands on activities or labs.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What is the Ohm's Law? Sample response: Ohm's Law is a simple formula used to calculate voltage, current, or resistance when two of the variables are known.

Standard	05.0 Demonstrate proficiency in basic direct current (DC) circuits--The student will be able to:
Benchmark	5.06 Read and interpret color codes and symbols to identify electrical components and values.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	M, H
Benchmark Clarification	The student will read and interpret color codes and symbols to identify electrical components and values.
Content Focus	Resistor, color bands, symbols, schematic
Content Limits	Items may be reelated to aviation wiring schematics and components.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What is the difference between the first two color bands and the third color band of a resistor? Sample response: The first two color bands represent the first and second digit of the resistor value. The third color band represents the multiplier used to apply to the digits of the first two bands to calculate final value.

Standard	05.0 Demonstrate proficiency in basic direct current (DC) circuits--The student will be able to:
Benchmark	5.07 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) and oscilloscopes.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	M, H
Benchmark Clarification	The student will measure a circuit with a volt-ohm meter, digital volt-ohm meter, and an oscilloscope.
Content Focus	Oscilloscope, VOM, DVOM. DMM, Ohm's Law
Content Limits	Items may include circuits related to aviation.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Using a DVOM, measure the voltage of a circuit given to you by your instructor.

Standard	05.0 Demonstrate proficiency in basic direct current (DC) circuits--The student will be able to:
Benchmark	5.09 Apply Ohm's law to series circuits.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	M, H
Benchmark Clarification	The student will apply Ohm's Law to series circuts.
Content Focus	Ohm's Law, series circuit
Content Limits	Items may include DC circuits related to aviation.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What is the current flowing through a series circuit that has a six volt power supply and a two ohm load? A. 2/6 amps B. 3 amps C. 8 amps D. 12 amps Answer B

Standard	05.0 Demonstrate proficiency in basic direct current (DC) circuits--The student will be able to:
Benchmark	5.11 Apply Ohm's law to parallel circuits.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	M, H
Benchmark Clarification	The student will apply Ohm's Law to parallel circuits.
Content Focus	Ohm's Law, parallel circuit
Content Limits	Items may include DC circuits related to aviation.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Use the parallel circuit shown above to answer the following question. What is the total current of the circuit? A. 1/12 amp B. 12 amps C. 26 amps D. 48 amps Answer B

Standard	06.0 Demonstrate employability skills--The student will be able to:
Benchmark	6.03 Identify documents that may be required when applying for a job.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will identify documents that may be required when applying for a job.
Content Focus	None Specified
Content Limits	Items may include employment and interview documents.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which of the following items would not be accepted as identification when applying for a job? A. driver license B. passport C. student ID card D. voter registration card Answer C

Standard	06.0 Demonstrate employability skills--The student will be able to:
Benchmark	6.04 Complete a job application form correctly.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	H
Benchmark Clarification	The student will complete a job application form correctly.
Content Focus	None Specified
Content Limits	Items may include a basic job application.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Completely fill out the job application provided. Once complete, turn it in to your instructor.

Standard	06.0 Demonstrate employability skills--The student will be able to:
Benchmark	6.05 Demonstrate competence in job interview techniques.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	H
Benchmark Clarification	The student will demonstrate appropriate interview techniques.
Content Focus	Interviewing
Content Limits	Items may include interview questions based on general information and skills acquired through the program.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What is your greatest strength and what is your greatest weakness? Provide support for your claim. Sample response: My greatest strength is that I am reliable. I recieved a perfect attendance award in school. My greatest weakness is that I have limited aviation experience. However, I have completed two unpaid internships to enhance my skill set.

Standard	06.0 Demonstrate employability skills--The student will be able to:
Benchmark	6.07 Identify acceptable work habits.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will identify acceptable work habits.
Content Focus	Reliability, team work, diversity, critical thinking
Content Limits	Items may include habits that are related to good work ethic.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What is the quality of being able to work with people of differing age groups, ethnicities, and gender called? A. critical thinking B. diversity C. reliability D. team work Answer B

Standard	07.0 Demonstrate an understanding of entrepreneurship--The student will be able to:
Benchmark	7.01 Define entrepreneurship.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will define entrepreneurship.
Content Focus	Entrepreneurship
Content Limits	None specified
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What is the act of owning a business called? A. employed B. entrepreneurship C. management D. public servant Answer B

Standard	07.0 Demonstrate an understanding of entrepreneurship--The student will be able to:
Benchmark	7.03 List the advantages and disadvantages of business ownership.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will list the advantages and disadvantages of business ownership.
Content Focus	Entrepreneurship
Content Limits	None specified
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What are the advantages and disadvantages of business ownership? (Name one for each). Sample response: One advantage of business ownership is that you create your own schedule and control your own destiny. One disadvantage of business ownership is that the owner assumes all of the risk if the business fails.

Standard	07.0 Demonstrate an understanding of entrepreneurship--The student will be able to:
Benchmark	7.05 Identify the necessary personal characteristics of a successful entrepreneur.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will identify the personal characteristics of a successful entrepreneur.
Content Focus	Entrepreneur, locus of control, faith, perserverance, personality traits, ambiguity
Content Limits	None Specified
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What are two personality traits that are important for entrepreneurs? Sample response: Having an internal locus of control is important because that quality is what allows you to control your own destiny. Also, vision is important to foresee where your company can be in the future.

Standard	08.0 Demonstrate proficiency in knowledge of basic computer usage--The student will be able to:
Benchmark	8.02 Demonstrate the use of computer application programs (i.e., word processing, data base, Excel).
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	H
Benchmark Clarification	The student will demonstrate use of computer application programs.
Content Focus	None Specified
Content Limits	Items may include common applications such as word processing, data base, spreadsheet, and other formatting tools.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Create a resume using Microsoft Word. Include your personal information, education, experience, objective, and one other category of your choice. Save the document as LastName_FirstName_Resume.doc

Standard	09.0 Demonstrate proficiency in advanced DC circuits--The student will be able to:
Benchmark	9.03 Apply Ohm's law to series-parallel and parallel-series circuits.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	H
Benchmark Clarification	The student will apply Ohm's Law to series-parallel and parallel-series circuits.
Content Focus	Ohm's Law, series-parallel, parallel-series, current, amperes, voltage, resistance, ohms
Content Limits	Items should be limited to DC circuits
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	In the series-parallel circuit pictured above, which load has the greatest voltage drop? A. load #1 B. load #2 C. load #3 D. load #4 Answer B

Standard	09.0 Demonstrate proficiency in advanced DC circuits--The student will be able to:
Benchmark	9.09 Describe magnetic properties of circuits and devices.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will describe magnetic properties of circuits and devices.
Content Focus	Magnetism, electro-magnetism, induction, magnetic field, mangetic flux
Content Limits	Items should be limited to DC circuits
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which of the following is an electro-magnetic switch? A. capacitor B. circuit breaker C. relay D. transistor Answer C