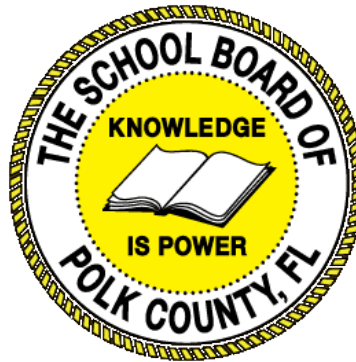


Individual Test Item Specifications

8742010- Diesel Engine Service 1

2015



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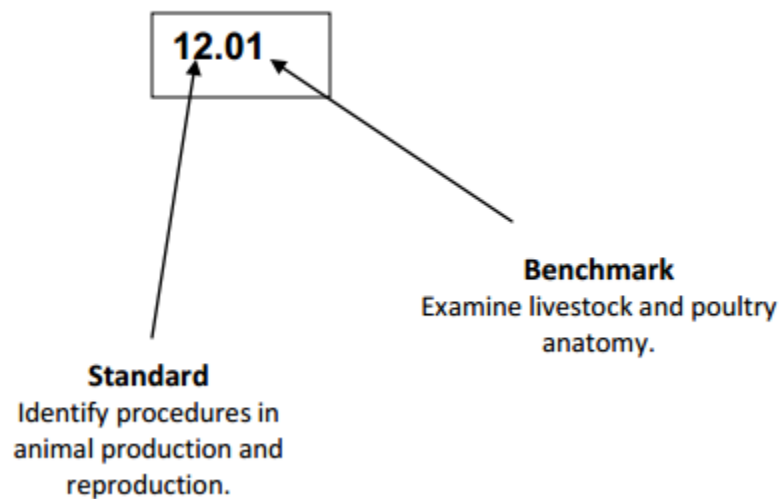
I. Guide to the Individual Benchmark Specifications

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 Identify shop organization, management, and safety requirements--The student will :
Benchmark	4.01 Identify basic shop organization and management regulations.
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 basic shop organization and management regulations.
Content Focus	Manager, supervisor, shop foreman, company policies
Content Limits	Items should be limited to medium duty and heavy duty truck and bus organizations.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which of the following describes the correct organizational hierarchy of a shop? A. general manager, service manager, shop supervisor B. general manager, shop supervisor, service manager C. service manager, general manager, shop supervisor D. shop supervisor, general manager, service manager Answer A

Standard	04.0 Identify shop organization, management, and safety requirements--The student will :
Benchmark	4.02 Identify and apply required shop-safety practices.
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 and apply required shop safety practices.
Content Focus	Shop safety, OSHA
Content Limits	Items may include shop safety practices limited to diesel shop operations.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which of the following is an explosion hazard? A. alternator B. catalytic converter C. empty gas tank D. oil pan Answer C

Standard	04.0 Identify shop organization, management, and safety requirements--The student will :
Benchmark	4.03 Identify and describe shop-maintenance procedures, including precautions for handling and storing work-related chemicals and hazardous materials.
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 and describe shop maintenance procedures, including precautions for handling and storing work-related chemicals and hazardous materials.
Content Focus	Hazardous materials, OSHA regulations, EPA regulations, chemical waste storage
Content Limits	Items may include procedures and precautions related to the medium duty and heavy duty truck and bus industry.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Name two hazardous chemicals/materials and how to properly store them. Sample response: waste oil should be stored in a containment that is specifically labeled. Antifreeze/coolant needs a separate containment from oil.

Standard	05.0 Identify the basic diesel components and functions--The student will :
Benchmark	5.01 Identify types of bearings and their uses.
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 types of bearings and their uses.
Content Focus	Bearings, taper bearings, roller bearings
Content Limits	Items should be limited to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which type of bearing is used with a spindle? A. ball bearings B. roller bearings C. sealed bearings D. taper roller bearings Answer D

Standard	05.0 Identify the basic diesel components and functions--The student will :
Benchmark	5.02 Identify seals, gaskets, and fasteners.
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 seals, gaskets, and fasteners.
Content Focus	Gasket, seal, nut, bolt, rivet, o-ring, cap screw, washer
Content Limits	Items should be limited to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which of the following is a non-threaded fastener? A. cap screw B. head bolt C. lock nut D. pop rivet Answer D

Standard	05.0 Identify the basic diesel components and functions--The student will :
Benchmark	5.03 Identify drive power train components and functions.
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 drive power train components and functions.
Content Focus	Engine, power take off, transfer case, differential, transmission
Content Limits	Items should be limited to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	On the vehicle provided, identify the transfer case to your instructor.

Standard	05.0 Identify the basic diesel components and functions--The student will :
Benchmark	5.04 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility
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 fasteners by size, type, thread series, thread classes, material hardness, and compatibility.
Content Focus	Pitch, tensile strength, grade, course, fine UNC, UNF, metric
Content Limits	Items may include standard and metric fasteners.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which of the following is not a way to measure thread pitch? A. course B. fine C. medium D. metric Answer C. medium

Standard	o6.o Demonstrate the use of basic tools and equipment--The student will :
Benchmark	6.01 Identify and use the following correctly and safely: a. Basic hand tools b. Basic welding tools and equipment c. Power tools d. Measuring and precision tools e. Read a digital multimeter
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will identify and use the following correctly and safely: basic hand tools, basic welding tools, power tools, measuring tools, and read a digital multimeter.
Content Focus	Digital multimeter (DMM), metric system, customary system, air tools, hand tools, power tools
Content Limits	Items may include hand tools, power tools, and measuring tools specific to the repair and maintenance of medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	<p>Using an engine on an engine stand, torque the cylinder head. Use service information (SI) to determine torque specifications and torque sequence. Demonstrate appropriate tool selection and use of the tools needed for this job. Rubric: 4 Points:</p> <p>The response indicates that the student has a thorough understanding of how to select the proper hand tools to torque a cylinder head and completes the following tasks:</p> <p>Student uses SI to determine cylinder head torque, angle, and sequence. Student selects the correct tools (socket, torque angle meter, and torque wrench). Student sets the torque wrench to the proper setting. Student torques the cylinder head following the proper sequence and uses the torque wrench correctly.</p> <p>3 Points:</p> <p>The response indicates that the student has an understanding of how to select the proper hand tools to torque a cylinder head and completes three tasks.</p> <p>2 Points:</p> <p>The response indicates that the student has a partial understanding of how to select the proper hand tools to torque a cylinder head and competes two tasks.</p> <p>1 Point:</p> <p>The response indicates that the student has a very limited understanding of how to select the proper hand tools to torque a cylinder head and completes one task.</p>

	<p>0 Points: The response indicates that the student does not demonstrate an understanding of how to select the proper hand tools to torque a cylinder head and completes no tasks.</p>
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Standard	07.0 Demonstrate shop and occupational safety procedures--The student will :
Benchmark	7.01 Assist in activities and job tasks, in accordance with local, state, and federal safety and environmental regulations.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will assist in activities and job tasks, in accordance with local, state, and federal safety and environmental regulations.
Content Focus	OSHA, EPA, personal protective equipment (PPE), tool safety, hazardous material storage
Content Limits	Items may include job tasks related to medium duty and heavy duty truck and bus shops.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	<p>Take the oil drain bucket and empty it following federal, state and/or local laws.</p> <p>Rubric:</p> <p>4 Points: The response indicates that the student has a thorough understanding of how to empty an oil bucket while following local laws. The student has identified the correct waste containment. The student has demonstrated how to empty the oil from the bucket into the waste containment. The student has cleaned any spillage following federal, state, and/or local laws. The student has removed any oil filters from the bucket and placed them in the correct waste containment.</p> <p>3 Points: The response indicates that the student has an understanding of how to empty an oil bucket while following local laws and has completed three of the four steps.</p> <p>2 Points:</p>

	<p>The response indicates that the student has a partial understanding of how to empty an oil bucket while following local laws and has completed two of the four steps.</p> <p>1 Point: The response indicates that the student has a very limited understanding of how to empty an oil bucket while following local laws and has completed one of the four steps.</p> <p>0 Points: The response indicates that the student does not demonstrate an understanding of how to empty an oil bucket while following local laws. The student has completed no steps correctly.</p>
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Standard	07.0 Demonstrate shop and occupational safety procedures--The student will :
Benchmark	7.02 Identify and comply with personal and environmental safety practices associated with clothing, eye protection, hand tools, power equipment, and the handling, storage, and disposal of chemicals and hazardous materials.
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 and comply with personal and environmental safety practices associated with clothing, eye protection, hand tools, power equipment, and the handling, storage, and disposal of chemicals and hazardous materials.
Content Focus	OSHA, EPA, personal protective equipment (PPE), tool safety, hazardous material storage.
Content Limits	Items may include personal and environmental safety relating to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Which of the following chemicals can be stored in the same container as motor oil? A. coolant B. diesel fuel C. gasoline D. power steering fluid Answer D

Standard	o8.o Identify principles, assemblies, and systems of engine operation--The student will :
Benchmark	8.01 Explain the basic principles in the operation of the four-stroke-cycle diesel engine
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 explain the basic principles in the operation of the four stroke cycle of a diesel engine.
Content Focus	Four stroke cycle, compression
Content Limits	Items may include four stroke cycle limited to diesel engines. Items should not include four stroke cycle of gasoline engines.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	During the intake stroke, what is happening in the four stroke cycle? A. air compressed B. air pulled into the chamber C. fuel sprayed into the chamber D. gases exhausted out Answer B

Standard	o8.o Identify principles, assemblies, and systems of engine operation--The student will :
Benchmark	8.02 Identify engine assemblies and systems.
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 engine assemblies and systems.
Content Focus	Cooling system, lubrication system, V8, V10
Content Limits	Items may include engine assemblies and systems related to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	What are two systems that engine assemblies incorporate? Sample response: cooling system and lubrication system

Standard	o8.o Identify principles, assemblies, and systems of engine operation--The student will :
Benchmark	8.o3 Explain the operating principles of two-and-four-stroke-cycle engines.
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 explain the operating principles of two and four stroke cycle engines.
Content Focus	Two stroke, four stroke
Content Limits	Items should be limited to medium duty and heavy dut truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	<p>What is one similarity and one difference between two stroke and four stroke engines?</p> <p>Sample response: One similarity is that a stroke is one up or down movement of the piston. One difference is that a two stroke requires two piston movements to complete one cycle and a four stroke requires four piston movements to complete one cycle.</p>

Standard	o8.o Identify principles, assemblies, and systems of engine operation--The student will :
Benchmark	8.04 Identify the equipment of two-and-four-stroke-cycle engines.
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 equipment of two and four stroke cycle engines.
Content Focus	Four stroke cycle, compression, two stroke cycle
Content Limits	Items should be limited to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	<p>Name a piece of equipment that uses a two stroke diesel and another that uses a four stroke diesel engine.</p> <p>Sample response: Generators can be either two or four stroke. Stationary diesel engines can be used anywhere power is needed and are typically four stroke.</p>

Standard	o8.0 Identify principles, assemblies, and systems of engine operation--The student will :
Benchmark	8.05 Identify governor types and their operating principles.
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 governor types and their operating principles.
Content Focus	Governor, centrifugal, servo, pneumatic, electromechanical
Content Limits	Items should be limited to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Name two types of governors. Sample response: Mechanical governor and electronic governor

Standard	09.0 Demonstrate the qualifications for employment--The student will :
Benchmark	9.01 Demonstrate the shop organization, management, and safety requirements for a diesel engine technician.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will demonstrate the shop organization, management, and safety requirements for a diesel engine technician.
Content Focus	OSHA, EPA, work related policies
Content Limits	Items may include shop organization, management, and safety related to medium duty and heavy duty truck and bus facilities.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	Demonstrate to your instructor how to prepare your workspace prior to engine disassembly.

Standard	09.0 Demonstrate the qualifications for employment--The student will :
Benchmark	9.02 Demonstrate the use of tools and equipment required for a diesel engine technician.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will demonstrate the use of tools and equipment required for a diesel engine technician.
Content Focus	None Specified
Content Limits	Items may include tools and equipment limited to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	<p>Demonstrate to your instructor how to read engine parameters with a scan tool.</p> <p>Rubric:</p> <p>4 Points: The response indicates that the student has a thorough understanding of how to use a scan tool to access engine data and completes the following tasks: Student connects the scan tool into the data link connector (DLC). Student powers up the scan tool and inputs the correct vehicle information. Student accesses one engine parameter selected by the instructor. Student accesses trouble code information from the scan tool.</p> <p>3 Points: The response indicates that the student has an understanding of how to use a scan tool to access engine data and completes three tasks.</p> <p>2 Points: The response indicates that the student has a partial understanding of how to use a scan tool to access engine data and completes two tasks.</p> <p>1 Point: The response indicates that the student has a very limited understanding of how to use a scan tool to access engine data and completes one task.</p>

	<p>0 Points: The response indicates that the student does not demonstrate an understanding of how to use a scan tool to access engine data and completes no tasks.</p>
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Standard	09.0 Demonstrate the qualifications for employment--The student will :
Benchmark	9.03 Demonstrate workplace communications skills required by diesel engine technician.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will demonstrate workplace communication skills required by diesel engine technicians.
Content Focus	None Specified
Content Limits	Items may include communication related to medium duty and heavy duty truck and bus technicians.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	<p>What are two ways technicians communicate information about repairs?</p> <p>Sample response: Technicians can write out the cause of failure and the correction for the problem. Technicians can also use inspection sheets to document the current state of the vehicle and to recommend maintenance.</p>

Standard	09.0 Demonstrate the qualifications for employment--The student will :
Benchmark	9.05 Demonstrate employability skills as a diesel engine technician.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	L, M
Benchmark Clarification	The student will demonstrate employability skills as a diesel engine technician.
Content Focus	None Specified
Content Limits	Items may include employability skills related to medium duty and heavy duty truck and bus.
Stimulus Attributes	None Specified
Response Attributes	None Specified
Sample Item	<p>What are two employability skills required of diesel technicians?</p> <p>Sample response: Time management skills are important so the technician can keep time obligations set for repairs. Also, self-motivation is vitally important because the technician is responsible for managing his own workflow.</p>