Individual Test Item Specifications

9200120- Automation and Production Technology 2

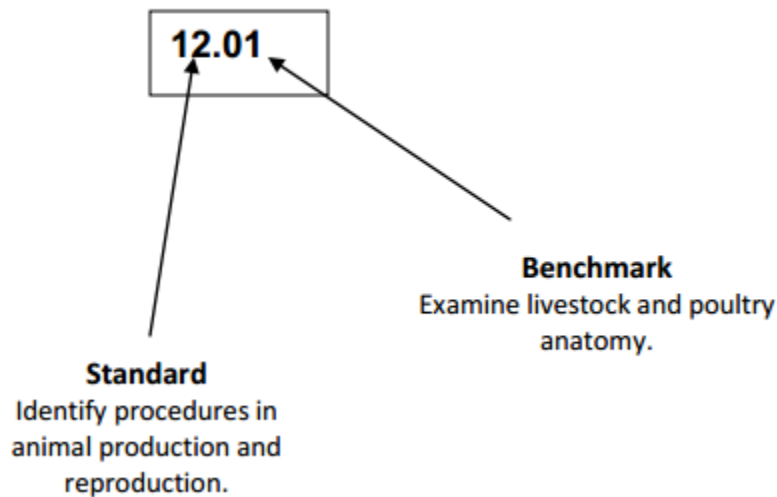### 2015
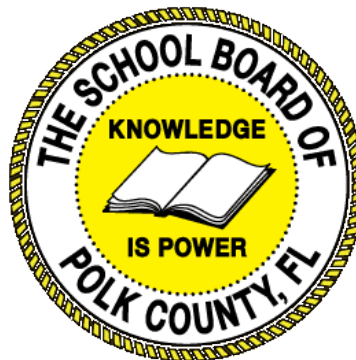
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I. Guide to the Individual Benchmark Specifications

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:

12.01

Benchmark
Examine livestock and poultry anatomy.
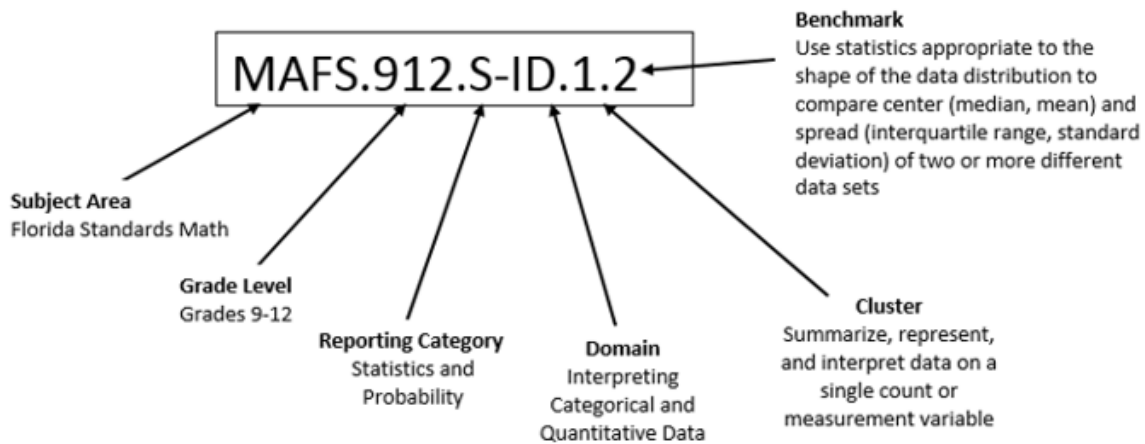
Standard
Identify procedures in animal production and reproduction.

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**.

Benchmark
Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets

MAFS.912.S-ID.1.2

Subject Area
Florida Standards Math

Grade Level
Grades 9-12

Reporting Category
Statistics and Probability

Domain
Interpreting Categorical and Quantitative Data

Cluster
Summarize, represent, and interpret data on a single count or measurement variable

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	10.0 Demonstrate an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.
Benchmark	10.04 Differentiate between technological and non-technological problems, and identify which problems can be solved using technology.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The student will identify scenarios in which technology can improve a given situation.
Content Focus	Training, Aggregate Error, Tolerance, Troubleshooting
Content Limits	All processes, procedures and actions will relate to the benchmark. Exclude questions regarding specific classroom activities/equipment unless details of those activites/equipment will be given in the stimulus.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	Which of the following problems could you solve by adding a technological component to the manufacturing process? A) Third shift always over-packs the boxes on a certain machine. B) First shift produces more than second shift on a particular machine. C) A circuit breaker on a machine repeatedly trips for no apparent reason. D) Occasionally, a linear actuator slides too far forward and causes misalignment. Correct Answer: D

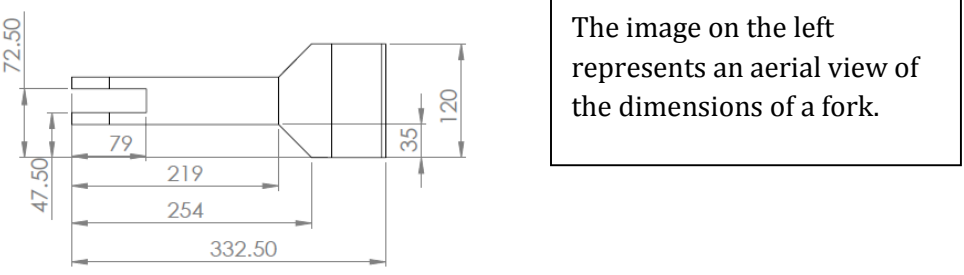| Standard	11.0 Demonstrate an understanding of thermal technology.
Benchmark	11.01 Measure temperature and convert between temperature scales.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Low - Moderate
Benchmark Clarification	The student will measure temperature and convert between fahrenheit, celsius, and Kelvin scales.
Content Focus	Fahrenheit, Celsius, Kelvin
Content Limits	All processes, procedures and actions will relate to the benchmark. Exclude questions regarding specific classroom activities/equipment unless details of those activites/equipment will be given in the stimulus.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one right answer. Responses may also consist of student sentences / phrases that demonstrate knowledge in this area.
Sample Item	What would be the Fahrenheit equivalent of 32 degrees Celsius? A) 57.6 B) 64.6 C) 89.6 D) 94.6 Correct Answer: C

Standard	11.0 Demonstrate an understanding of thermal technology.
Benchmark	11.02 Calculate the change in length of a material given a change in temperature using the slope intercept and standard form of the equation expression this relationship.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The student will use slope intercept (Y=mX+B) to predict how changes in temperature can change the physical length of a given material.
Content Focus	Slope Intercept, Y2-Y1 / X2-X1
Content Limits	All processes, procedures and actions will relate to the benchmark. Exclude questions regarding specific classroom activities/equipment unless details of those activites/equipment will be given in the stimulus.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	If a piece of stainless steel measures 10" at 75 degrees Fahrenheit, and 10.009" at 200 degrees Fahrenheit, how long would the steel measure at 400? A) 10.002 B) 10.02 C) 10.2 D) 10.23 Correct Answer: B

Standard	11.0 Demonstrate an understanding of thermal technology.
Benchmark	11.06 Calculate gas properties using the Ideal Gas Law.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The student will use ideal gas law (PV=nRT, Pressure, Volume, Moles, Constant, Temperature)
Content Focus	Ideal Gas Law
Content Limits	All processes, procedures and actions relating to the benchmark. Exclude questions regarding specific classroom activities/equipment unless details of those activites/equipment will be given in the stimulus.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	A balloon contains 4 moles of an ideal gas with a volume of 5.0 L. If an additional 8 moles of the gas is added at constant pressure and temperature, what will be the final volume of the balloon? A) 1L B) 5L C) 10L D) 15L Correct Answer: D

Standard	11.0 Demonstrate an understanding of thermal technology.
Benchmark	11.08 Analyze a system using the first law of thermodynamics.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)= (SA)= (P)=X (ER)=X
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The student will use the first law of thermodynamics (The change of heat in an internal system is equal to the heat added to the system minus the work performed by the system.
Content Focus	Conservation of energy, Joule, Calorie, BTU
Content Limits	All processes, procedures and actions will relate to the benchmark. Exclude questions regarding specific classroom activities/equipment unless details of those activites/equipment will be given in the stimulus.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	Under normal circumstances, how would you expect heat to dissipate in any given system? A) from hotter areas to colder areas B) from colder areas to hotter areas C) from areas of greater friction to lesser friction D) it remains concentrated near the work performed Correct Answer: A

Standard	12.0 Demonstrate an understanding of communication and workplace computer skills.
Benchmark	12.02 Read and understand graphs, charts, diagrams, and common table formats.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Low - Moderate
Benchmark Clarification	The student will read and interpret graphical representations of data including tables, charts, and diagrams.
Content Focus	Pareto Principle, X Chart, SPC Chart, Stacked Bar Chart, Central tendency, Bar Chart, Table, Collomn, Row, Axis
Content Limits	All processes, procedures and actions will relate to the benchmark. Exclude questions regarding specific classroom activities/equipment unless details of those activites/equipment will be given in the stimulus.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	What does a Pareto Chart display? A) Seperates the vital few from the insignificant many. B) Distribution of process variables over a given length of time. C) Distribution of a single data point in relation to the nominal value. D) Percentage of the whole that a data range represents. Correct Answer: A

Standard	13.0 Demonstrate the ability to read and accurately interpret blueprints and schematics.
Benchmark	13.01 Define basic blueprint terminology such as title block, border, views, notes, revision blocks, etc. In addition, the individual will recognize the intent of the drawing and its use in manufacturing.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)= (SA)= (P)=X (ER)=X
Cognitive Complexity Level	Low - Moderate
Benchmark Clarification	The student will identify the basic parts of a manufacturing blueprint.
Content Focus	Title block, border, views, notes, revision block, common symbols
Content Limits	All processes, procedures and actions relating to this benchmark in regard to manufacturing blueprints. Exclude blueprints that are intended for building construction
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	In which area of a blue print would you be able to find the current engineering change level of the part depicted by the print? A) Notes B) Revision block C) Title block D) View area Correct Answer: B

Standard	13.0 Demonstrate the ability to read and accurately interpret blueprints and schematics.
Benchmark	13.03 Interpret Linear, Circular, and Angular dimension features on a print.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The student will interpret dimensions on a manufacturing blueprint.
Content Focus	Linear Dimension, Alligned Dimension, Angle, Radius, Diameter, Counter Bore, Chamfer, Fillet,
Content Limits	All processes, procedures and actions relating to this benchmark in regard to manufacturing blueprints. Exclude blueprints that are intended for building construction
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	The image on the left represents an aerial view of the dimensions of a fork. Use the print that is included to answer the following. What is the width of the fork on the left side of the part in the top view? A) 25.0mm B) 47.5mm C) 72.5mm D) 79.0mm Correct Answer: A

Standard	13.0 Demonstrate the ability to read and accurately interpret blueprints and schematics.
Benchmark	13.04 Identify general note symbols and their applications within a manufacturing environment. Examples of symbols include finishing requirements, material specifications, machining/manufacturing specifications, assembly symbols, ANSI symbols, ISO symbols
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Low - Moderate
Benchmark Clarification	The student will interpret basic symbols relating to manufacturing blueprints.
Content Focus	ISO Symbols, ANSI Symbols
Content Limits	All processes, procedures and actions relating to this benchmark in regard to manufacturing blueprints. Exclude blueprints that are intended for building construction
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	What does a circle with a slash through it generally refer to when reading a print? A) diameter of a hole B) depth of a hole C) location of a hole's center D) radius of a curve Correct Answer: B

Standard	13.0 Demonstrate the ability to read and accurately interpret blueprints and schematics.
Benchmark	13.05 Locate notes on a print using industry standards, using three drawings with two minutes per note and 100% accuracy.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)= (SA)= (P)=X (ER)=X
Cognitive Complexity Level	Low - Moderate
Benchmark Clarification	The student will locate and interpret notes on a manufacturing blueprint quickly with total accuracy.
Content Focus	Blue print, Symbol, Annotation, Dimensioning Scheme, ASME,
Content Limits	All processes, procedures and actions relating to this benchmark in regard to manufacturing blueprints. Exclude blueprints that are intended for building construction
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	When reading a print, where would you expect to find the units in which the dimensions are given? A) following each dimension B) title block C) upper left D) upper right Correct Answer: A

Standard	13.0 Demonstrate the ability to read and accurately interpret blueprints and schematics.
Benchmark	13.06 Interpret commonly used abbreviations and terminology used on prints in the manufacturing environment.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low - Moderate
Benchmark Clarification	The student will interpret common abbreviations and terminology on a manufacturing blueprint.
Content Focus	Radius, Abbreviation, Diameter, linear dimension, alligned dimension, leader, tolerance stack up,
Content Limits	All processes, procedures and actions relating to this benchmark in regard to manufacturing blueprints. Exclude blueprints that are intended for building construction
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	What does the abbreviation AF typically mean when you are reading a print? A) across flats B) after finish C) always file D) assume flat Correct Answer: A

Standard	13.0 Demonstrate the ability to read and accurately interpret blueprints and schematics.
Benchmark	13.08 Determine if a part dimension is within tolerance using conventional tolerancing.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)= (SA)=X (P)=X (ER)=
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The student will interpret tolerances from a blueprint to determine if dimensions on a part fall within those tolerances.
Content Focus	Tolerance, GDT, Upper Tolerance, Lower Tolerance
Content Limits	All processes, procedures and actions relating to this benchmark in regard to manufacturing blueprints. Exclude blueprints that are intended for building construction
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	If a point on a part has a tolerance of plus/minus .005 mm and a nominal dimension is .5 mm, would a measurement of .506 be acceptable? Explain your answer. 2 points - response is correct (right answer is no, it is out of tollerance) and the reason is given. 1 point - response is correct, but no reason given. 0 points response is incorrect.

Standard	14.0 Demonstrate proficiency in the use of quality assurance methods and quality control concepts.
Benchmark	14.01 Demonstrate knowledge of quality systems such as Statistical Process Control (SPC), Six Sigma, Total Quality Management (TQM), and International Standards Organization (ISO) 9000.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Low - Moderate
Benchmark Clarification	The student will demonstrate basic knowledge of the following quality management systems / tools: SPC, Six Sigma, TQM, ISO.
Content Focus	Six Sigma, SPC, TQM, ISO, Joseph Jurran ,Edward Demming, Phillip Crosby, COPQ (Cost of poor Quality), LEAN
Content Limits	All processes, procedures and actions relating to the stated QMS tools/systems. Exlcude any classroom or industry specifc QMS tools/systems such as QS9000, QSB, TS16949 etc.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	Which type of chart plots process variables inbetween upper and lower control limits and helps manufacturing personal to determine if a process is within control limits? A) Histogram B) Pareto Chart C) Run Chart D) X bar chart Correct Answer: C

Standard	14.0 Demonstrate proficiency in the use of quality assurance methods and quality control concepts.
Benchmark	14.03 Demonstrate knowledge of statistics for making accurate decisions about quality data.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The students will make calculatoins that are common to the creation and analysis of SPC charts. Further, students should be able to analyze SPC information and make decisions regarding that information.
Content Focus	Average, Upper Control Limits, Lower Control Limits, Special Cause, Common Cause, Pareto Principle, "Vital Few," "Insignificant Many"
Content Limits	All processes, procedures and actions relating to calculations and analysis common to statistical process control. Exlcude any classroom or industry specifc QMS tool systems such as QS9000, QSB, TS16949, etc.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	If studying a histogram to determine if a process is in control, What should an operator see in regard to the distribution of data points? A) points should make a flat line B) points should make a bell that leans to the left C) points should make a bell that leans to the right D) points should make a bell that is toward the center Correct answer: D

Standard	14.0 Demonstrate proficiency in the use of quality assurance methods and quality control concepts.
Benchmark	14.10 Demonstrate knowledge of how to use inspection tools, equipment and procedures.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)=X (ER)=
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The students will explain the major parts/mechanisms that are common to standard precision measurement tools. Further, students should demonstrate knowledge of how and when to use standard precision measurement tools including (but not limited to) caliper
Content Focus	Caliper, Micrometer, Ruler, Temperature probes (different types),
Content Limits	All processes, procedures, and actions relating to the use and care of precision measurement equipment. Exclude items that are specific to a particular equipment manufacturer.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	Which of the following tools is best suited for the task of measuring the depth of a hole? A) caliper B)depth micrometer C) inside micrometer D) tape measure Correct Answer: C

Standard	14.0 Demonstrate proficiency in the use of quality assurance methods and quality control concepts.
Benchmark	14.11 Use and convert both U.S. measurement and standard international metric systems using precision measurement tools such as: a machinist's rule, tape measure, caliper, micrometer, digital gage, pH meter, and thermometer.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)= (SA)= (P)=X (ER)=X
Cognitive Complexity Level	Low - Moderate
Benchmark Clarification	The student will use both metric and standard percision measurement tools. Students will also convert measurements between metric and standard systems.
Content Focus	Metric, standard
Content Limits	All processes, procedures, and actions relating the conversion of measurements between metric and standard systems. Exclude items that are specific to particular equipment manufacturers unless the details of the system can be included in the question stem
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	How many millimeters is one inche equal to? A) 2.54 B) 25.4 C) 254 D) 2540 Correct Answer: B

Standard	14.0 Demonstrate proficiency in the use of quality assurance methods and quality control concepts.
Benchmark	14.29 Describe and explain the concepts of Lean Manufacturing
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Low-Moderate
Benchmark Clarification	The student will identify, describe, and explain various concepts that are associated with lean manufacturing.
Content Focus	KANBAN, POKAYOKE, Value Stream, Push v Pull production, Muda, Muri, Mura, Kaizen, Takt Time, JIT, Judoka, Overall Equipment Effectiveness
Content Limits	All processes, procedures and actions that allow a student to describe and explain the main concepts of Lean manufacturing. Exclude any industry specific practices unless the details regarding the practice can be made available in the stem.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	What type of inventory control system builds products according to forecasted sales? A) lean B) pull C) push D) traditional Correct Answer: A

Standard	14.0 Demonstrate proficiency in the use of quality assurance methods and quality control concepts.
Benchmark	14.33 Describe and explain the use of the 6S's (sort, set in order, shine, standardize, sustain, safety).
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Low-Moderate
Benchmark Clarification	The student will describe, explain, and apply the aspects of 6S shop organization.
Content Focus	6 S
Content Limits	All processes, procedures and actions relating to this benchmark. Exclude questions that would be classroom or workplace specific.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	If a shop is truly organized, how long should it take any employee to find a tool? A) 30 seconds B) 3 minutes C) 30 minutes D) an hour Correct Answer: A

Standard	15.0 Demonstrate an understanding of modern business practices and enterprise systems.
Benchmark	15.05 Interpret a Bill of Materials.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)= (SA)= (P)=X (ER)=X
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	The student will read and interpret a bill of materials
Content Focus	Bill of materials
Content Limits	All processes, procedures and actions relating to this benchmark in regard to manufacturing blueprints. Exclude blueprints that are intended for building construction
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	In which area of a print might the bill of materials be located? A) Upper Right B) Lower Right C) Upper Left D) Lower Left Correct Answer: A

Standard	15.0 Demonstrate an understanding of modern business practices and enterprise systems.
Benchmark	15.14 Identify and explain personal and organizational consequences of unethical or illegal behaviors in the workplace.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	Moderate - High
Benchmark Clarification	Given a scenario, the student will make legal and ethical decisions regarding proper businesses practices. Further, students will identify the consequences of an unethical or illegal act in the workplace.
Content Focus	Ethical, Illegal
Content Limits	All processes, procedures and actions relating to this benchmark. Exclude items that would be deemed unethical under a specific classroom's or employer's rules.
Stimulus Attributes	Stimulus may consist of stems phrased as questions in regard to the benchmark. Stimuli may include diagrams, tables, and graphics when appropriate.
Response Attributes	Responses may consist of three distractors with one correct answer. Responses may also consist of student sentences/phrases that demonstrate knowledge in this area.
Sample Item	Is it ever acceptable to sign off on the quality of a part if you have not actually made the checks yourself? Explain. You will need to answer both parts for full credit. 2 points - both parts answered with thoughtfullness 1 point only one part answered 0 points thoughtless answer.