Individual Test Item Specifications

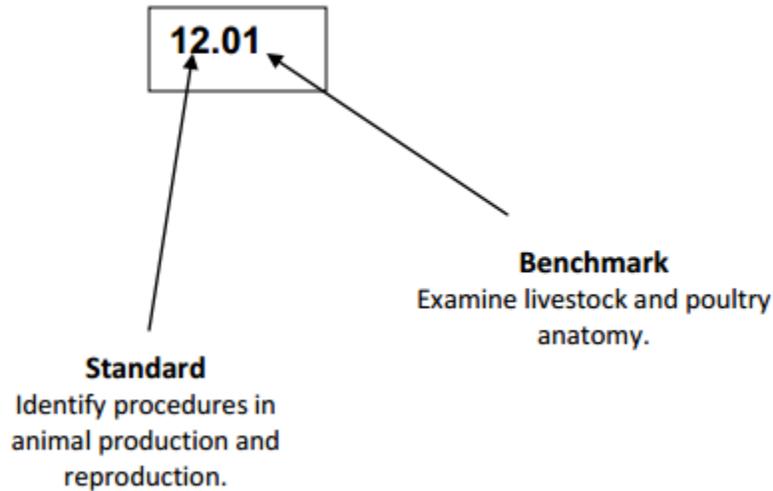## 8401110- Applied Engineering Technology 1

2015
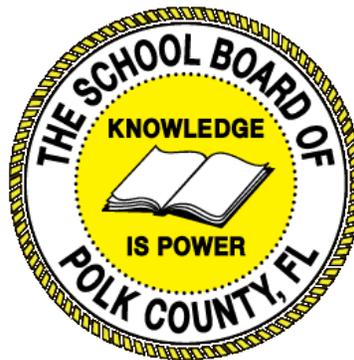
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I. Guide to the Individual Benchmark Specifications

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:

12.01

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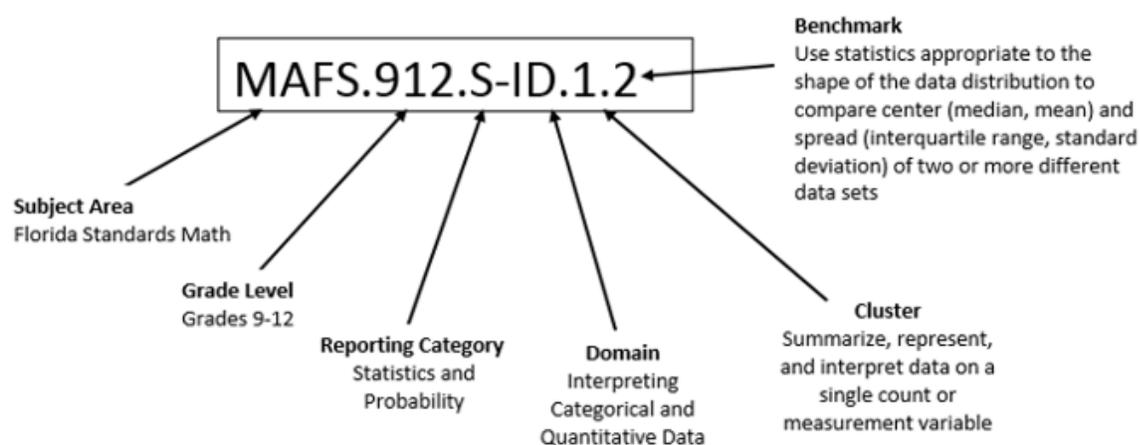
Standard
Identify procedures in animal production and reproduction.

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 Demonstrate foundational knowledge and skills associated with the design of a mechanical system. – The student will be able to:
Benchmark	10.02 Define and calculate quantities involving mass, weight, force, torque, friction, and resistance.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=10 Demonstrate foundational knowledge and skills associated with the design of a mechanical system. – The student will be able to: (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand how to calculate quantities and their purpose.
Content Focus	Mass, weight, force, torque, friction, resistance
Content Limits	Items will be limited to how to calculate quantities accurately.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What are the two types of mechanical resistance? a. electrical and thermal b. friction and resistance c. static and kinetic d. wet and dry friction Correct answer: d

Standard	10 Demonstrate foundational knowledge and skills associated with the design of a mechanical system. – The student will be able to:
Benchmark	10.03 Identify simple machines.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will be able to identify the six simple machines and provide examples.
Content Focus	Pulley, lever, wedge, inclined plane, screw, wheel and axle
Content Limits	Items will be limited to identifing and providing examples of the six simple machines.
Stimulus Attributes	Images may be used.
Response Attributes	Students will identify simple machines by site and example.
Sample Item	A bottle opener is an example of which simple machine? a. inclined plane b. lever c. screw d. wedge answer b lever

Standard	11 Demonstrate technical knowledge and skills for machining. - The student will be able to:
Benchmark	11.01 Measure dimensions using precision measurement tools, such as rulers, scales, calipers, and micrometers.
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 understand the correct use of industry measuring tools.
Content Focus	Rulers, scales, calipers, and micrometers, customary, metric
Content Limits	Items will be limited to using measuring tools accurately.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What is a measuring instrument with two adjustable jaws typically used to measure diameter or thickness? a. calipers b. cylinder c. rulers d. scales Correct answer: a

Standard	11 Demonstrate technical knowledge and skills for machining. - The student will be able to:
Benchmark	11.02 Identify appropriate tools for machining purposes (e.g., drilling, turning, milling, sawing, and grinding).
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the functions of machining tools and know which tool is appropriate for the project.
Content Focus	Drilling, turning, milling, sawing, grinding, lathe, press
Content Limits	Items will be limited to choosing the right machining tool for the project.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What machine creates an object with symmetry around an axis of rotation? a. cnc mill b. injection molding c. lathe d. welding Correct answer: a

Standard	12 Demonstrate foundational technical knowledge and skills associated with the design of fluid systems. – The student will be able to:
Benchmark	12.03 Differentiate between pneumatics and hydraulics.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the difference between pneumatics and hydraulics.
Content Focus	Pneumatics, hydraulics, pressure, air, water, fluid, compression
Content Limits	Items will be limited to how pneumatics and hydraulics differ.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	Pneumatics is a very clean system that has no risk of contamination. What manufacturing process would this be used in? a. automotive b. energy generation c. food manufacturing d. robotics Correct answer: c

Standard	13 Demonstrate foundational technical knowledge and skills associated with the design of thermal systems. – The student will be able to:
Benchmark	13.01 Define and differentiate between heat and temperature.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the difference between heat and temperature.
Content Focus	Temperature, heat, celsius, hotness, coldness, centigrade, fahrenheit, thermal, energy
Content Limits	Items will be limited to how to determine the difference between heat and temperature.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What term describes the intensity of hotness and coldness in an object? a. heat b. temperature c. thermal d. tropic Correct answer: b

Standard	13 Demonstrate foundational technical knowledge and skills associated with the design of thermal systems. – The student will be able to:
Benchmark	13.02 Describe the three laws of thermodynamics as they relate to the design of a thermal system.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the three laws of thermodynamics.
Content Focus	Three laws of thermodynamics, thermal systems, Conservation of Energy, entropy , equilibrium, constant value, absolute zero
Content Limits	Items will be limited to the design of a thermal system uses the three laws of thermodynamics.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What is the thermodynamic process called in which the pressure stays constant? a. Adiabatic process b. Isobaric process c. Isochoric process d. Polytropic process Correct answer: b

Standard	14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Benchmark	14.01 Compare and contrast basic electronic components (e.g., resistor, capacitor, transistor, coil, diode).
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand basic electronic components and their uses.
Content Focus	Resistor, capacitor, transistor, coil, diode, Light-Emitting Diodes, Integrated Circuits,
Content Limits	Items will be limited to how to differentiate the different electronic components such as but not limited to: resistor, capacitor, transistor, coil, diode.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What is a semiconductor device with two terminals which typically allows the flow of current in one direction only? a. capacitor b. diode c. resistor d. transistor Correct answer: b

Standard	14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Benchmark	14.03 Define and calculate quantities involving charge, voltage, current, resistance, impedance, inductance, and capacitance.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the purpose and how to calculate electrical calculations.
Content Focus	Charge, voltage, current, resistance, impedance, inductance, and capacitance
Content Limits	Items will be limited to how to calculate basic electrical quantities such as but not limited to: charge, voltage, current, resistance, impedance, inductance, and capacitance
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	If you have 10 volts and 40 watts, what is the amperage or current? a. .25 amps b. .50 amps c. 2 amps d. 4 amps Correct answer: d

Standard	14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Benchmark	14.05 Describe the differences between a series and a parallel circuit.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the differences between a series and a parallel circuit.
Content Focus	Series, parallel circuit, electrical circuit, electronic circuit, current, voltage,
Content Limits	Items will be limited to how to differentiate the uses of a series and a parallel circuit.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	Three lights are connected in a parallel across a 120 volt source. If one light burns out what will happen to the lights? a. remaining two will glow dimmer b. remaining two will not light c. remaining two will glow brighter d. remaining two will stay Correct answer:

Standard	14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Benchmark	14.06 Differentiate between alternating and direct current.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the difference between alternating and direct current.
Content Focus	Alternating current, direct current,
Content Limits	Items will be limited to differentiateing alternating and direct current.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What type of circuit is a constant stream of current in one direction? a. alternating current b. direct current c. flow current d. static current Correct answer: b

Standard	14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Benchmark	14.07 Measure voltage, current, resistance, and capacitance using a multimeter.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Low, Moderate
Benchmark Clarification	The student will properly connect a multimeter to measure current, voltage, resistance and capacitance.
Content Focus	Voltage, current, resistance, capacitance, amperes, ohms, farads.
Content Limits	Limited to measurements of voltage, current, capacitance and resistance
Stimulus Attributes	Images may be used
Response Attributes	Students will identify correct setup and reading of a multimeter
Sample Item	A meter should be at what setting in order to measure resistance? a. Amperes b. Ohms c. Voltage d. Wattage Correct answer: b

Standard	14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Benchmark	14.08 Define and calculate quantities using Ohm's Law.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Moderate, High
Benchmark Clarification	The student will be able to properly calculate Ohm's Law.
Content Focus	Voltage, current, resistance, milli, micro, mega, kilo14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Content Limits	Items will be limited to how to convert from milliamperes to amperes.
Stimulus Attributes	Images may be used
Response Attributes	Students will calculate ohm's law from circuit examples.
Sample Item	14.08 Ohms law What is the current in a circuit with 10 volts and 2 ohms of resistance? a. 2 A b. 5 A c. 12 A d. 20 A Correct answer: b

Standard	14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Benchmark	14.09 Define and calculate quantities using Watt's Law.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Moderate, High
Benchmark Clarification	The student will make calculations using Watt's Law.
Content Focus	Voltage, current, resistance, milli, micro, mega, kilo
Content Limits	Items will be limited to how to convert from milli to micro, and kilo to mega etc.
Stimulus Attributes	students are provided with real work examples for watt's law.
Response Attributes	Students will solve for power from circuit examples.
Sample Item	14.09 A circuit had 10 amperes and 120 volts, what is the power rating? a. 12 W b. 110 W C. 130 W d. 1200 W Correct answer: d

Standard	14 Demonstrate foundational knowledge and skills associated with the design of electrical and electronic systems. – The student will be able to:
Benchmark	14.10 Define and calculate quantities using Kirchhoff's voltage and current laws.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will make calculations using Kirchhoff's voltage and current laws.
Content Focus	Voltage, current, resistance
Content Limits	Items will be limited to Kirchhoff's laws.
Stimulus Attributes	Students will be provided example circuits from descriptions and schematics
Response Attributes	Students will be able to define all of kirchhoff's laws
Sample Item	The sum of the voltage drops in a circuit is equal to the source voltage is a statement of what law? A. Ohm's Law B. Watt's Law C. Joule's law D. Kirchhoff's law Correct answer: D

Standard	16.0 Identify computer components and their functions. – The student will be able to:
Benchmark	16.01 Identify the internal components of a computer (e.g., power supply, hard drive, motherboard, I/O cards/ports, cabling, etc.).
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will identify internal computer parts by name, picture and function.
Content Focus	Motherboard, power supply, hard drive, motherboard, I/O cards/ports, cabling, IDE
Content Limits	Only include main internal parts, not to the component level.
Stimulus Attributes	Images may be used.
Response Attributes	Students will identify internal computer parts from images and form their descriptions.
Sample Item	16.01 What is the most common port used to connect a desktop computer to the internet a. ethernet b. firewire c. parallel d. serial Correct answer: a

Standard	16.0 Identify computer components and their functions. – The student will be able to:
Benchmark	16.02 Identify various computer input devices (e.g., mouse, keyboard, phone, camera) and describe their use.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will identify computer input devices by name, picture and function.
Content Focus	Mouse, keyboard, camera, microphone, scanner, stylus, tablet, joysticks
Content Limits	Items will be limited to common input devices from images and descriptions.
Stimulus Attributes	Images may be used.
Response Attributes	Students will identify computer input devices from description or images.
Sample Item	What is the most common input device used with a graphics tablet? A. Camera B. keyboard C. stylus d. trackball Correct answer: c

Standard	16.0 Identify computer components and their functions. – The student will be able to:
Benchmark	16.03 Identify various computer output devices (e.g., monitor, printer, phone) and describe their use.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will identify computer output devices by name, picture and function.
Content Focus	Phone, monitor, printer
Content Limits	Limited to common output devices
Stimulus Attributes	Images may be used.
Response Attributes	Students will identify output devices by description and images.
Sample Item	Which computer output device would be capable of creating a cell phone case? a. monitor b. 3D printer c. color laser printer d. dye sublimation printer Correct answer: b

Standard	16.0 Identify computer components and their functions. – The student will be able to:
Benchmark	16.04 Identify various storage devices (e.g., flash drive, iPod, phone, external hard drive, etc.)
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will identify computer storage devices by name, picture and function.
Content Focus	Flash drive, cloud, phone, external hard drive, DVD, CD-ROM
Content Limits	Limited to common storage devices
Stimulus Attributes	Images may be used.
Response Attributes	Students will identify computer input devices from description or images.
Sample Item	Which external storage device allows storage of a large number of photographs and movies? a. ipod b. phone c. flash drive D. external hard drive Correct answer: d

Standard	17 Demonstrate proficiency with common computer peripherals, including connections to standard input and output devices. – The student will be able to:
Benchmark	17.01 Identify the types and purposes of common input devices (e.g., mouse, keyboard, camera, microphone, scanner).
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand input devices for the computer.
Content Focus	Mouse, keyboard, camera, microphone, scanner, stylus, tablet, joysticks, digital cameras
Content Limits	Items will be limited to how input devices are connected to a computer.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What technology is used to keep account information safe when using credit and ATM cards? a. encryption b. magnetic ink c. magnetic strip d. password Correct answer: c

Standard	17 Demonstrate proficiency with common computer peripherals, including connections to standard input and output devices. – The student will be able to:
Benchmark	17.02 Identify the types and purposes of specialized input devices (e.g., digital cameras, mobile devices, GPS devices).
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand specialized input devices.
Content Focus	Digital Camera Digital storing device, Game Controller, Scanners & Barcode Readers, Touch Display Screen, Stylus, mobile devices, GPS devices
Content Limits	Items will be limited to input devices for different types of input.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What is the device that can change image into codes for input to the computer? a. bar code reader b. stylus c. touch display screen d. touchpad Correct answer: a

Standard	17 Demonstrate proficiency with common computer peripherals, including connections to standard input and output devices. – The student will be able to:
Benchmark	17.03 Describe the types and purposes of various computer connection ports (e.g., USB, firewire, parallel, serial, Ethernet, et al).
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand computer connections.
Content Focus	USB, firewire, parallel, serial, Ethernet, PS/2, Serial, VGA, SCSI, HDMI, Digital Camera Digital storing device, Game Controller, Scanners & Barcode Readers, Touch Display Screen, Stylus
Content Limits	Items will be limited to different computer connection ports such as but not limited to: USB, firewire, parallel, serial, Ethernet.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What type of port does a 25 pin port use for scanners and printers? a. HDMI b. parallel port c. serial port d. VGA port Correct answer: b

Standard	18 Demonstrate knowledge of computer file management. – The student will be able to:
Benchmark	18.03 Be able to identify file types by extension (e.g., .doc, .txt, .wav, xls, etc.).
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand computer file types by their extension.
Content Focus	doc, .txt, .wav, xls, cad, sfd, dfd, psd, il, mov, aiff, jpg, png
Content Limits	Items will be limited to how to identify files by the extensions.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	Stephanie was looking for a photoshop file on her computer. What file extension should she look for? a. .paf b. .pdx c. .psd d. .psmodel Correct answer: c

Standard	19.0 Demonstrate proficiency using the Internet to locate information. – The student will be able to:
Benchmark	19.01 Identify and use web terminology.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	Students will identify and define common web terms.
Content Focus	Http, https, html, blog, jpg, ASCII, ASP, Cookie, DHCP, FTP, ping
Content Limits	Questions are limited to common terms and abbreviations
Stimulus Attributes	Images may be used.
Response Attributes	Student will identify abbreviations, and common internet terms from examples and definitions.
Sample Item	Which letters indicate that the web page has a special layer of encryption added to hide your personal information and passwords? a. html b. http c. https D. voip correct answer C https

Standard	19.0 Demonstrate proficiency using the Internet to locate information. – The student will be able to:
Benchmark	19.04 Demonstrate proficiency using search engines, including Boolean search techniques.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=
Cognitive Complexity Level	Low, Moderate
Benchmark Clarification	Students will identify the types of Boolean searches, and define Boolean search strings.
Content Focus	AND, OR, quotes
Content Limits	Questions are limited to the basic boolean search strings
Stimulus Attributes	Images may be used.
Response Attributes	Student will be able to use Boolean searches and identify thier uses.
Sample Item	Which of the following is an example of a Boolean search? A. Cats, dogs b. Cats AND dogs c. Cats (dogs) D. Cats with dogs correct answer b Cats AND dogs

Standard	20 Demonstrate an understanding of Internet safety and ethics. – The student will be able to:
Benchmark	20.01 Describe cyberbullying and its impact on perpetrators and victims.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the impact of cyber bullying.
Content Focus	Cyberbullying, monitoring, trolling, cyberstalking, denigration, social networks, victim, symptoms, netiquette,
Content Limits	Items will be limited to how to identify cyberbullying and its impact.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What is it called when you receive a negative text or e-mail that was sent to a mass group? a. bullycide b. cyberstalking c. flaming d. trolling Correct answer: c

Standard	20 Demonstrate an understanding of Internet safety and ethics. – The student will be able to:
Benchmark	20.02 Differentiate between viruses and malware, specifically their sources, ploys, and impact on personal privacy and computer operation, and ways to avoid infection.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the differences between a virus and malware and their hazards.
Content Focus	Virus, malware, symptoms, reasons, protection, privacy, infection, spam, worm, trojan horse, firewall
Content Limits	Items will be limited to the effects of both viruses and malware and how to avoid them.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	Many firms protect the network with a security system consisting of hardware and/or software that protects the computer network from most viruses and malware. What is this method called? a. backup b. encryption c. firewall d. lock Correct answer: c

Standard	20 Demonstrate an understanding of Internet safety and ethics. – The student will be able to:
Benchmark	20.04 Describe risks associated with social networking sites (e.g., FaceBook, MySpace, and Twitter) and ways to mitigate these risks.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the potential hazards of social media websites.
Content Focus	Social media, cyberbullying, cyberstalking, obscene and inappropriate content, , loss of control, loss of privacy, scams, hacking, hijacking, password safety, tagging, badge of popularity,
Content Limits	Items will be limited to the risks of social media sites and how to address them.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What is NOT a risk of social media? a. advertising b. loss of privacy c. scams d. tagging Correct answer: a

Standard	5 Demonstrate an understanding of the core concepts of technology. – The student will be able to:
Benchmark	5.04 Identify the criteria and constraints of a product or system and determine how they affect the final design and development.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the relationship between criteria and constraints in a design.
Content Focus	Criteria, constraints, design, design cycle, factors, purpose, budget
Content Limits	Items will be limited to how criteria and constraints are used in designs.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	You are creating a new part for a machine and it is of a plastic material that is both mechanically tough and chemically resistant. How does this innovation impact the final development? a. the new material will make it safer b. the new material will

Standard	5 Demonstrate an understanding of the core concepts of technology. – The student will be able to:
Benchmark	5.06 Identify new technologies that create new processes.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the emerging technologies that impact or create a new process.
Content Focus	Emerging, technology, process, genetic engineering techniques, additive technology, digitized, drones, artificial intelligence, robotics
Content Limits	Items will be limited to new technologies that create new processes.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	Ford just introduced an aluminum bodied pickup. Even though aluminum is more expensive than steel, Ford kept basically the same selling price. What new processes did Ford invest in to make this project a reality? a. build new production plants especially for the new design b. build new specialized dealerships c. use the same body design to interchange parts d. use existing plants and substitute aluminum for iron Correct answer: a

Standard	5 Demonstrate an understanding of the core concepts of technology. – The student will be able to:
Benchmark	5.07 Describe a quality control process to ensure that a product, service or system meets established criteria.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand quality control.
Content Focus	Commitment, improvements, requirements, standards, inspection, process, uniform, safety, consumer
Content Limits	Items will be limited to how a quality control process meets a requirement.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What is NOT a Phase of Quality Assurance? a. Acceptance sampling b. Continuous Improvement c. Inspection Issues d. Process Control Correct answer: c

Standard	6 Demonstrate an understanding of the attributes of design. – The student will be able to:
Benchmark	6.01 Describe the essential activities that comprise the design process.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the design process.
Content Focus	Design, design cycle, define the problem, brainstorm Research and generate ideas, identify constraints, explore possibility, select an approach, design proposal, make a model or prototype, test or evaluate, refine the design, create it, communicate proces
Content Limits	Items will be limited to how to use the design process in design.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	In the design process, what is the tool for systematically ranking alternatives according to a set of criteria? a. material catalog b. decision matrix c. idea table d. wants list Correct answer: b

Standard	6 Demonstrate an understanding of the attributes of design. – The student will be able to:
Benchmark	6.04 Explain how a design's criteria, constraints, and efficiency can compete with each other.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the relationship between criteria, constraints and efficiency and how it interacts with the final design.
Content Focus	Criteria, constraints, efficiency, relationship, trade offs, goals, requirements, materials, cost, safety, reliability, performance, maintenance, ease of use, aesthetics, policies, Life Cycle Analysis
Content Limits	Items will be limited to the trade offs that are possible when using constraints, criteria and efficiency in the design process.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What happens when the criteria and constraints affect the efficiency or goal of the project? a. change the criteria or constraints b. prototyping c. spin off d. trade off Correct answer: d

Standard	6 Demonstrate an understanding of the attributes of design. – The student will be able to:
Benchmark	6.05 Identify the factors that ensure the sustainability of an engineering design.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand what elements lead to a sustainable design.
Content Focus	Sustainability, durable, non-durable, facilities, adaptability, social, economic, environmental
Content Limits	Items will be limited to how to design using appropriate methods to make the project sustainable.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	Life Cycle Analysis assesses what aspect of a product's sustainability? a. consumer b. environmental c. political d. social Correct answer: a

Standard	7 Demonstrate an understanding of the engineering design process. – The student will be able to:
Benchmark	7.03 Discuss why the engineering design process must begin with a clearly stated problem.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand how purpose drives the design cycle.
Content Focus	Design cycle, problem, purpose, importance, society, political, medical
Content Limits	Items will be limited to how to create a design based on a problem/purpose.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What does every engineering design process have in common? a. computers b. equipment c. goals d. specified time frame Correct answer: c

Standard	7 Demonstrate an understanding of the engineering design process. – The student will be able to:
Benchmark	7.04 Explain the relationship between design criteria and design constraints.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)=X (P)= (ER)=
Cognitive Complexity Level	Low
Benchmark Clarification	The student will understand the relationship between criteria and constraints in a design.
Content Focus	Criteria, constraints, design, design cycle, factors, purpose, budget
Content Limits	Items will be limited to how criteria and constraints are used in designs.
Stimulus Attributes	Worksheets, observations, hands on assignments, examples and non examples, simulations, role playing
Response Attributes	Documents, checklists, design briefs, project scope, feedback, performance rubrics, simulations, examples
Sample Item	What limits the creativity of the design process? a. constraints b. criteria c. implementation d. research Correct answer: a