Individual Test Item Specifications
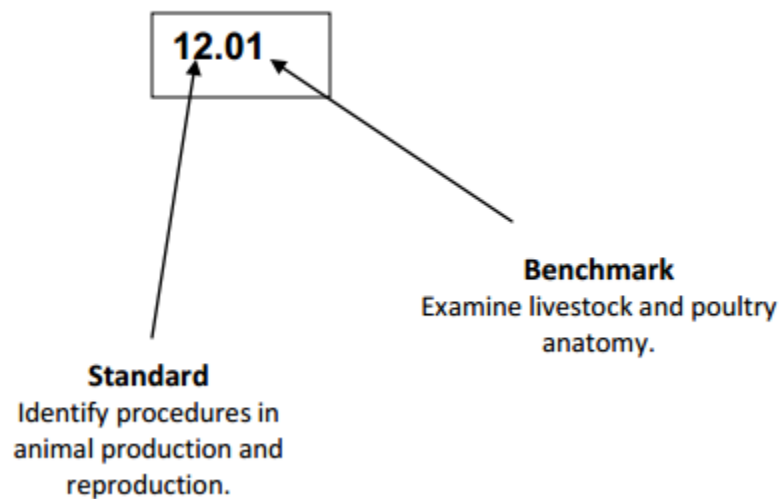
8112020- Aquaculture 3

2015
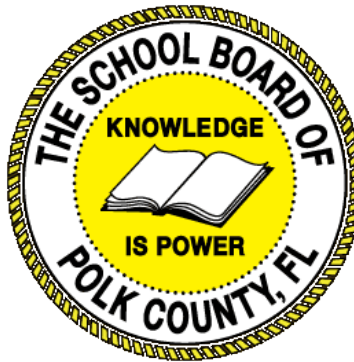
Table of Contents

I. Guide to the Individual Benchmark Specifications

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

Benchmark Classification System

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

An example, from Agritechnology 1:

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	27.0 Exhibit the management and environmentally sound use of water and land resources.
Benchmark	27.01 Calculate volume in circular, rectangular and irregular shaped water structures.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will calculate the volume of water structures using given formulas.
Content Focus	Conversions, ft3 to gallon, ft3
Content Limits	The items may be limited to common aquaculture structures.
Stimulus Attributes	The stimulus may or may not include illustrations, pictures, scenarios and charts.
Response Attributes	The response may require the student to make multiple conversions.
Sample Item	Short answer: What is the volume of a rectangular tank measuring 4 feet wide, 30 feet long and 3 feet deep? V=LxWxH Answer: 360ft^3/tank

Standard	27.0 Exhibit the management and environmentally sound use of water and land resources.
Benchmark	27.02 Identify and explain point and non-point pollution management associated with aquaculture.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify point and non-point pollution and discuss management practices to deal with disposing of aquaculture wastewater.
Content Focus	Wastewater, effluent, eutrophication, settling ponds, percolation ponds, filtering systems, chemical additives, Environmental Protection Agency (EPA), Natural Resources Conservation Service (NRCS)
Content Limits	The items may include identifying pollution sources, identifying management practices for treating wastewater, identifying state and federal governmental agencies that regulate wastewater.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to identify sources of pollution and select best management practice for disposing of wastewater based on scenario.
Sample Item	Which is the proper term for wastewater? A. effluent B. seepage C. titrant D. turbidity Answer: A

Standard	27.0 Exhibit the management and environmentally sound use of water and land resources.
Benchmark	27.03 Determine soil types, land slope and other factors to consider in choosing a location for an aquaculture operation.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will select desirable qualities for an aquaculture operation in terms of soil type, topography, closeness and type of watershed, water availability and water source.
Content Focus	Clay, loam, peat, gravel, slope, watershed pond, surface water, ground water, discharge
Content Limits	The items may include identifying soil types for described aquaculture ponds, desirable slopes for described aquaculture ponds, identifying best land characteristics for desirable aquaculture pond types.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to select and/or describe desirable land characteristics for given aquaculture ponds.
Sample Item	Which type of aquaculture pond requires a location that has an adequate supply of water from a well, spring, reservoir, or stream because there is no watershed in the area for runoff water to enter the pond? A. excavated pond B. impoundment pond C. levee-type pond D. natural pond Answer: C

Standard	27.0 Exhibit the management and environmentally sound use of water and land resources.
Benchmark	27.06 Discuss the advantages and disadvantages of hydroponics and aquaponics.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify hydroponic and aquaponic systems and discuss the advantages and disadvantages of each.
Content Focus	Sustainable food production, bio-integrated food production system, effluent, biofiltration
Content Limits	The items may include identifying sustainable aquaculture practices, identifying advantages of hydroponic and aquaponic food production, identifying disadvantages of hydroponic and aquaponic food production.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to select and/or describe advantages and/or disadvantages of hydroponic and/or aquaponic food production as a sustainable food source.
Sample Item	What are the best plants to grow in an aquaponic system? A. fruiting plants B. grains C. leafy greens and herbs D. ornamental plants Answer: C

Standard	28.0 Complete the propagation and culture of an aquaculture organism.
Benchmark	28.01 Identify and describe the methods of reproducing aquaculture organisms.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify and/or describe methods of reproducing common aquaculture organisms
Content Focus	Hormonal, spawning containers, egg transfer, pen spawning, fry transfer, California trays, vertical trays, upwelling trays
Content Limits	The content may include but not be limited to identifying and/or describing reproduction methods and associated tools and equipment of common aquaculture organisms.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to visually identify reproduction methods, select a reproduction method based on a description, describe a reproductive method, select and/or identify a tool used in given reproductive methods, and/or identify the reproductive method of a given aquatic species.
Sample Item	Which fish reproduces by laying eggs on a vertical substrate, such as a slate tile? A. angelfish B. goldfish C. molly D. swordtail Answer: A

Standard	29.0 Demonstrate procedures used in locating markets and marketing aquaculture products.
Benchmark	29.1 Develop a marketing plan for an aquaculture product.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify the steps required to market an aquaculture product.
Content Focus	Wholesaling, retailing, advertising, promotion, profitability, distributors, inputs
Content Limits	The items may include identifying and/or describing the steps required to market a common aquaculture product.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may include terms, phrases, sentences, images, diagrams, and/or charts.
Sample Item	Which is the proper term for creating consumer demand for an aquaculture product? A. assembling B. branding C. product pull D. product push Answer: C

Standard	31.0 Demonstrate leadership, employability, communication, networking, and human relations skills.
Benchmark	31.01 Demonstrate competence in job-interview techniques.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify and/or describe the appropriate behaviors and/or responses to successfully complete a job-interview.
Content Focus	Resume, cover letter, follow-up letter
Content Limits	The items may include parts of a resume, appropriate telephone etiquette, parts of a cover letter, and/or appropriate etiquette for following up an interview.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may include terms, phrases, sentences, images, diagrams, and/or charts.
Sample Item	Where would a job applicant list previous work experience? A. cover letter B. follow up letter C. reference card D. resume Answer: D

Standard	32.0 Produce an aquaculture species in or more of the following: pond, cage, tank, raceway, net pen.
Benchmark	32.01 Identify the types of growing systems and important factors in their selection, design and use.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify types of growing structures and discuss important factors in the selection of components, design of the structure and what the structure will be used for.
Content Focus	Recirculating aquaculture system, levee-type ponds, excavated ponds, boring cages, net pens, freeboards
Content Limits	The items may include ponds, cages, tanks, raceways and net type aquaculture systems and the major components that are used to construct each type of system.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to visually identify a growing structure; may require students to select components of an aquaculture structure based on a given use; may require students to identify appropriate components for a given aquaculture structure.
Sample Item	Which of the following is not a major component in a cage? A. feeding ring B. flotation C. frame D. freeboard Answer: D

Standard	32.0 Produce an aquaculture species in or more of the following: pond, cage, tank, raceway, net pen.
Benchmark	32.04 Select species for a specific culture facility.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will select an aquaculture species appropriate for a specific culture facility.
Content Focus	Raceway, silos, recirculating aquaculture system, ponds, nets, common aquaculture species
Content Limits	The items may include ponds, cages, tanks, raceways, nets and cages and common aquaculture species reared in each.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require students to identify, visually or written, a structure most appropriate for a given aquaculture species, and/or identify a structure based on a given species.
Sample Item	Which aquaculture species would be best for trout production? A. cage B. pond C. raceway D. tank Answer: C

Standard	32.0 Produce an aquaculture species in or more of the following: pond, cage, tank, raceway, net pen.
Benchmark	32.05 Determine feeding methods and calculate feeding rates for an aquaculture organism.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify feeding methods, including feed type, and calculate feeding rates for given aquatic species.
Content Focus	floating feed, extruded feed, microencapsulated feed, premixes, natural foods, feed conversion ratios
Content Limits	The items may include selecting appropriate feed types for a given aquaculture species; and/or calculate feeding rates using given formulas.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to select, visually or by description, a feed type for specific aquaculture species; may require students to calculate feeding rates based on given information.
Sample Item	Which feeding method is most effective in intensive catfish pond production? A. a blower-type feeder pulled by a tractor B. several daily hand feedings from a boat C. a single demand feeder mounted on the bank D. multiple automatic feeders mounted on the bank Answer: A

Standard	33.0 Control disease, pest and water quality problems.
Benchmark	33.01 Identify major diseases of several locally important commercial species and list different methods of prevention and treatment.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify major diseases of important Florida aquaculture species and list treatment methods and/or identify preventative measures.
Content Focus	Stressors, infectious disease, parasitic, bacterial, viral, fungal, noninfectious disease, dip, injections, bath
Content Limits	The items may include the identification of infectious and noninfectious diseases of commercially important Florida aquaculture species, treatment methods, and preventative measures.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to identify a disease, list a treatment plan, and/or identify a preventative strategy.
Sample Item	Which is a sign of the disease chilodonelliasis? A. bright red gills that can bleed B. hemorrhaging at the bases of fins C. lethargy D. swollen abdomen Answer: A

Standard	33.0 Control disease, pest, and water quality problems.
Benchmark	33.02 Identify major pests of several locally important commercial species and list recommended control methods.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will identify major pests of important Florida aquaculture species and/or list control methods.
Content Focus	Birds, turtles, crayfish, snails, alligators, frogs, air cannons, bird wire, nets, traps
Content Limits	The items may include the identification of major Florida aquaculture pests and routine control methods of a given pest.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to identify a pest and/or list a control method.
Sample Item	Which pest would require primarily daytime control? A. alligators B. blue herons C. bull frogs D. soft-shell turtles Answer: B

Standard	33.0 Control disease, pest, and water quality problems.
Benchmark	33.03 Describe methods of prevention, treatment and control of the major diseases and pests previously identified.
Item Types **(MC)-Multiple Choice** **(SA)-Short Answer** **(P)-Performance** **(ER)-Extended Response**	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will describe common methods of prevention, treatment and control of major diseases and pests that affect Florida aquaculture species.
Content Focus	Prognosis, dip, flush, bath, feeding, injections, vaccination, inoculation, infiltration, antigenicity, isolation
Content Limits	The items may include the description of preventative methods, treatments and controls of major diseases and pests that affect important Florida aquaculture species.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to describe a method of prevention, treatment and/or control of a specified major aquatic diseases and/or pest; and/or list the disease and/or pest that is controlled by a described prevention method, treatment and/or control.
Sample Item	Which of the following is not a treatment used to treat Ichthyophthiriasis, commonly called Ich? A. copper sulfate B. formalin C. oxytetracycline D. table salt Answer: C

Standard	34.0 Assist in harvesting and processing aquaculture species.
Benchmark	34.02 Determine harvesting practices recommended for aquaculture organisms.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will select the appropriate harvesting practices for a given important Florida aquaculture species.
Content Focus	Cast netting, seining, netting, hooks, siphoning, traps, draining, dredging
Content Limits	The items may include common harvesting practices of important Florida aquaculture species.
Stimulus Attributes	The stimulus may include scenarios, pictures, charts, diagrams, and/or tables.
Response Attributes	The response may require the student to identify appropriate harvesting practices for a specific, important Florida aquaculture species.
Sample Item	Which method is used to commercially harvest African cichlids in Florida? A. cast netting B. dip netting C. hooking D. seining Answer: D

Standard	34.0 Assist in harvesting and processing aquaculture species.
Benchmark	34.05 Determine processing and packaging practices recommended for aquaculture organisms.
Item Types (MC)-Multiple Choice (SA)-Short Answer (P)-Performance (ER)-Extended Response	(MC)=X (SA)= (P)= (ER)=X
Cognitive Complexity Level	L,M
Benchmark Clarification	The student will select the appropriate processing and packaging practices for a given Florida aquaculture species.
Content Focus	fillets, automatic deheading, enrobing, eviscerator, offal collector, skinning, chilling, grading, freezing, packaging
Content Limits	The items may include processing techniques and packaging practices used in the industry and specific to a given aquaculture species.
Stimulus Attributes	The stimulus may include identification of processing steps and/or packaging options for a given aquatic species; may require students to identify processing grading factors.
Response Attributes	The response may require the student to select the appropriate processing technique for a given species; may require students to determine the appropriate package type for a given species and/or market.

Sample Item	What is the first step in processing catfish, trout, and other similar finfish?
	  A. chilling
	  B. deheading
	  C. eviscerating
	  D. stunning
	
	  Answer: D