AQUACULTURE

CAREER DEVELOPMENT EVENT

RULES AND REGULATIONS

TEAM COMPETITION

ALABAMA FFA ASSOCIATION

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Aquaculture Career Development Event

PURPOSE

The Aquaculture Career Development Event (CDE) offers students the chance to compete in a variety of activities related to the aquaculture industry. As one of the fastest-growing sectors in agriculture, aquaculture provides numerous career opportunities, and this event allows students to gain hands-on experience in tasks integral to aquaculture operations. The event simulates daily responsibilities encountered on aquaculture farms, challenging students to apply their skills and knowledge in real-world scenarios. Through this competition, students not only enhance their technical abilities but also deepen their understanding of the industry's demands and opportunities.

ELIGIBILITY AND REGULATIONS

- For specific Eligibility Rules and Regulations, refer to the Contests and Awards Booklet.
- Only district eliminations will be held prior to the state event.
- The top four winners in the North, Central and South districts will compete in the state finals.
- The team will consist of a maximum of four FFA members, grades 7-12. The team's total score will be based on the sum of the points earned by the three highest scoring participants on the team.
- If a cell phone or smart watch is seen or heard in the possession of a competitor, that individual student will be disqualified from competition and receive a score of zero.
- Competitors must enter their **first and last** name **as well as their chapter number and name** on the scorecard or they will receive a score of zero. Judges will not attempt to figure out who the card belongs to.
- Scantron cards that are incorrectly completed (i.e. chapter numbers are not correctly shaded in, stray marks, etc.) will not be scored thus receiving a score of zero.

DISCLAIMER

In the event that contests (CDE, LDE, TDE's) cannot be held in person, a virtual option may be conducted. Contest rules and guidelines are subject to change to meet the needs of a virtual experience.

DRESS CODE

Participants must wear closed toed shoes/boots (no sandals, crocs or slides) and long pants (jeans with no holes/ khakis/dress pants) or skirts that cover the knees if not in official dress. Leggings, jogging pants, yoga, lycra, are not permitted. Shirts should be long enough to be tucked in (no crop tops or midriff showing) and not contain vulgar or suggestive material or language. Contest where oral reasons are given should respect the professionalism of the event, and dress aligning with the profession is preferred. Official FFA Dress is an allowable form of dress for all events. **Consequences for not being in dress code will result in disqualification, and the participant will not be allowed to compete.**

ALTERNATE POLICY

For district level events, if a chapter brings alternates there will be no more than two alternates allowed per team. Alternates will use a copy of the scan form (not an original) for those events scored via judgingcard.com. If more than four official scan forms are turned in for a chapter in one event, the highest score(s) for that team will be disqualified and deleted until the chapter only has four team members in the scoring system. Alternates must not be in groups with official team members.

For state level events, alternates are not allowed.

District Event Scoring Procedure and Format

Event Phases	Total Possible Team Points
Written Exam	100 (x3)
Species Identification	100 (x3)
Fish Anatomy	50 (x3)
Individual Total	**250 (x3)**
Team Total	**750**
(x#) indicates number of scores counted per chapter team	

State Event Scoring Procedures and Format

Event Phases	Total Possible Team Points
Water Quality Testing	100 (x3)
Species Identification	200 (x3)
Solution Concentrations	50 (x3)
Feed Ratio	50 (x3)
Individual Total	**400**
TEAM TOTAL	**1600**
(x#) indicates number of scores counted per chapter team	

1. **Written Exam (District):** Written Exam (District): This is an individual event where a 50-question exam will be administered to each individual within a 40-minute time limit. Each exam question is worth 2 points. Follow the link below for supplemental study materials. Related resources that pertain to the course of study content standards in aquaculture science and aquatic biology can be used as references. (https://freshwater-aquaculture.extension.org/water-quality-in-aquaculture/) TEST BANK is available at alabamaffa.org under the resources tab.

2. **Fish Anatomy Identification (District):** This is an individual event where each participant must identify the external and internal anatomy of a fish. This may be done utilizing a diagram or by identifying labels on an actual specimen. Each correct identification will count 2 points. This will be conducted as an Identification item on the scan form. See the attached diagram as a reference (labeled Fish Anatomy- page 6).

3. **Species Identification (District and State):** This is an individual event where each participant will be identifying species, randomly selected from the list of 60 species listed in the handbook. Participants will be provided with a master list of species to use for this phase of the contest. Each correct identification will count 5 points. The species may be shown as photographs, live specimens, or preserved specimens.
    - District Event: 20 species in 20 minutes
    - State Event: 40 species in 40 minutes

4. **Practicums (State Only):** All materials that are needed will be furnished. Additional practicum tests may be used for future competitions. This year's practicum tests will consist of the following:

    a. **Water Quality Testing:** This is individual event where 30 minutes will be given for the completion of this practicum. Each team member would test a different water sample for water quality parameters such as pH, Alkalinity, Hardness, Nitrate and Nitrite and make recommendations from the analysis.

    b. **Solution Concentrations:** This is an individual event where 30 minutes will be given for the completion of this practicum. Each participant will calculate appropriate solution concentrations for multiple tanks based on the volume of the system to determine the amount of additive needed. This includes that participants be able to calculate the volume of a tank in cubic inches, convert that to gallons/liters, and therefore determine the amount of additive that is needed to reach the target alkalinity. See attached worksheet for further instructions and all formulas that will be needed.

    c. **Feed Ratio:** This is an individual event where 30 minutes will be given for the completion of this practicum. Given multiple scenarios about various tanks, each participant will determine the appropriate feeding amount based on a given percentage of total biomass that is to be fed. See attached worksheet for further instructions.

    d. **New hands-on event activities coming 2025. Scoring will change based on the addition of the practicums.**

Tiebreakers

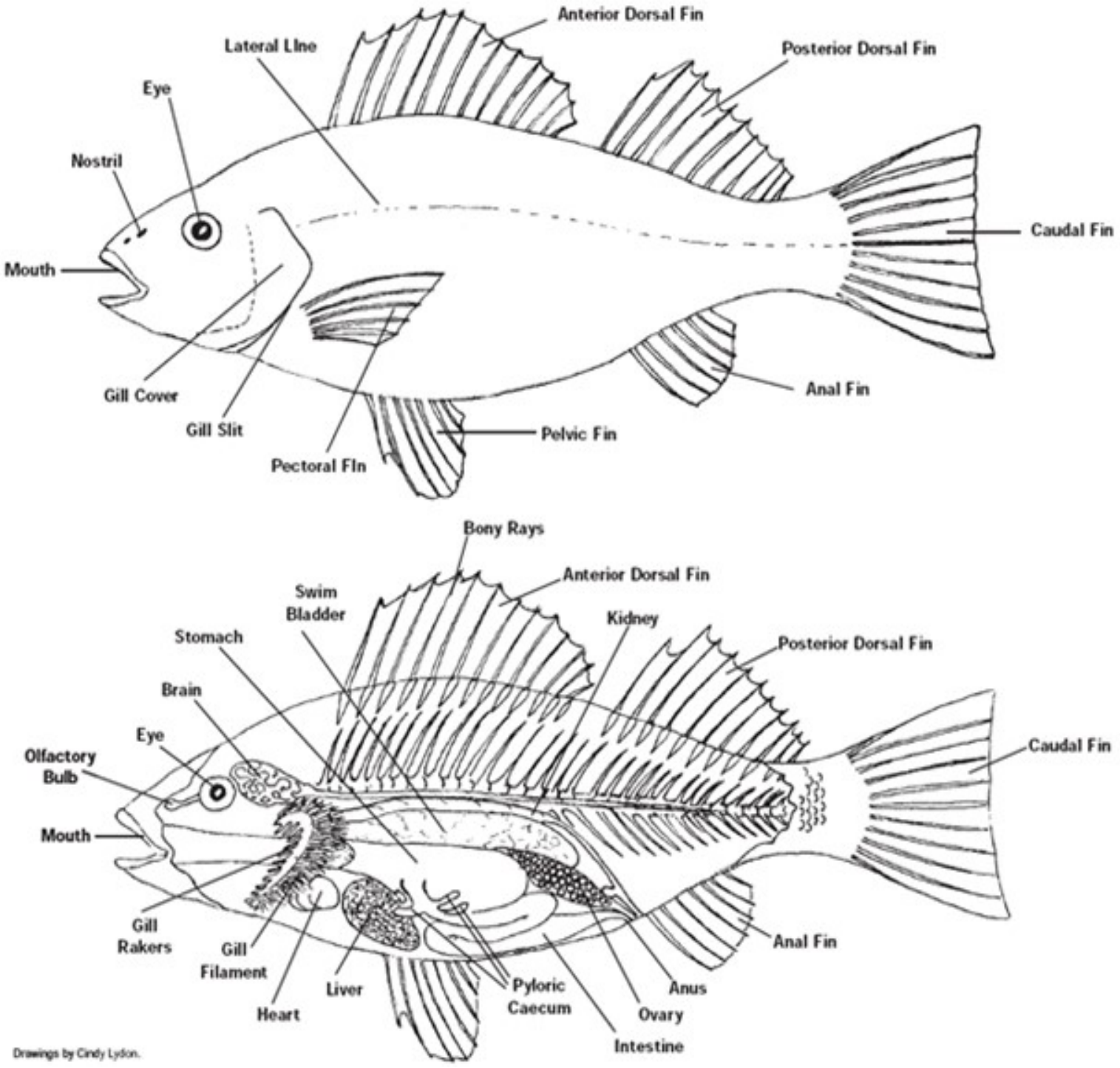
If a tie occurs, the following circumstances will be used in order to determine award recipients (For district event, #2-4 will be used):

1. Highest total of practicum scores.
2. Highest total of species identification scores.
3. Highest total of written examination scores.
4. Highest individual score on written examination.

Event Rules

1. The team will consist of four members. The team's total score will be based on the sum of the points earned by the top 3 participants on the team.
2. All materials needed for this event will be furnished.
3. If a cell phone is seen or heard in the possession of a competitor, that individual student will be disqualified from competition and receive a score of zero.
4. Competitors must enter their name on the scorecard, or they will receive a score of zero. Judges will not attempt to figure out who the card belongs to.
5. All individual safety equipment will be furnished by the participant for the state event. Safety glasses and closed toe shoes will be required at all times during the water testing phase. Participants who are violating general safety rules will be dismissed from the event.

Fish Anatomy



Water Quality Testing

Students will use the LaMotte Freshwater Aquaculture Test Kit to determine water quality from a variety of different sources. Eight critical test factors can be efficiently and accurately determined on-site by students, including alkalinity, ammonia nitrogen, carbon dioxide, chloride, nitrite nitrogen, pH, temperature, and total hardness. Lid label instructions will be provided. Students must be familiar with how to use, read and determine ways to adjust water quality parameters when needed.

Solution Concentrations

Formulas for Finding Volume:

Rectangular Tank: Length x Width x Height = Volume

Hexagonal Tank: (Base x Height x Length x .5) x 6 = Volume *Height is half of the tanks width

Octagonal Tank: (Base x Height x Length x .5) x 8 = Volume *Height is half of the tanks width

Cylindrical Tank: π x Radius^2 x Height = Volume *Radius is half of the tanks width

Oval Tank: (π × WidthA × WidthB × Height) / 4 = Volume *A = Minor Axis B = Major Axis

*if all measurements are made in inches the volume will be in cubic inches

Conversions:

231 in^3 = 1 gallon	1 gallon = 3.8 liters	1 ppm = 1 mg/L
1 kilogram= 1000 grams	1 hectogram= 100 grams	1 decagram= 10 grams
1 decigram= 0.1 grams	1 centigram= 0.01 gram	1 milligram= 0.001 gram

***all formulas and conversions must be memorized and will NOT be given**
***all calculations MUST be rounded to the nearest tenth**

Example Problems:

If a rectangular tank that measures 24 inches x 18 inches x 16 inches has an alkalinity of 50 ppm and a desired alkalinity of 85 ppm. What is the amount of sodium bicarbonate that needs to be added to reach the target alkalinity?

(24 in x 18 in x 16 in) = 6,912 in^3 → 6,912 in^3 ÷ 231 in^3/gallon = 29.9 gallons

29.9 gallons x 3.8 Liters = 113.6 Liters

85 ppm – 50 ppm = 35 ppm → 35 ppm = 35 mg/L

113.6 Liters x 35 mg/L = **3,976 mg** of sodium bicarbonate is needed to reach the target alkalinity

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A cylindrical tank has a height of 72 inches and a width of 32 inches. Water test results show an alkalinity of 25 ppm, and the target ppm is 70. How many milligrams of sodium bicarbonate should be added to reach the target alkalinity?

(3.14 x 16^2 x 72) = 57,876.5 in^3 → 57,876.5 in^3 ÷ 231 in^3/gallon = 250.5 gallons

250.5 gallons x 3.8 Liters = 951.9 Liters

70 ppm – 25 ppm = 45 ppm → 45 ppm = 45 mg/L

951.9 Liters x 45 mg/L = **42,835.5 mg** of sodium bicarbonate is needed to reach the target alkalinity

Feed Ratio

DIRECTIONS:

In this activity, you will weigh fish and determine biomass in order to formulate a proper feed ration. Because feed is a high cost, it is important not to overfeed. Fish have a tendency to gorge themselves when overfed, causing a fatty fish and contributing to off flavors when eaten. Additionally, underfeeding will increase the length of production time. Care must be taken to produce a quality product with minimum costs.

STEPS:

STEP 1 - Fill a one-gallon bucket about halfway with water and weigh it using the scales provided.
STEP 2 - Carefully remove 3 fish from a tank and place them in the bucket and record the new weight.
STEP 3 - Return fish to water.
STEP 4 - Plug numbers into formula and determine how much feed is needed per day.

FORMULA TO USE:

.025 x ((A + B + C)÷3) x N = F

*.025 = the percentage of biomass we feed (2.5%).

*A + B + C = each individual weight of the fish.

*Divide A+B+C by 3 (number of fish weighed) for the average weight per fish in the tank. *N = the total number of fish in the tank.

*F = the amount of feed needed per day.

NOTE: This formula must be memorized prior to event.

*Students can also be asked to calculate growth rates as well as grow out periods in relation to the feed ratio and weights of fish.

Species Identification List

	Common Name	Scientific Name	Fresh Water	Brackish Water	Salt Water
1	Common Carp	*Cyprinus carpio*	X		
2	Grass Carp	*Ctenopharyngodon idellus*	X		
3	Silver Carp	*Hypophthalmichthys molitrix*	X		
4	Golden Shiner	*Notemigonus crysoleucas*	X		
5	Channel Catfish	*Ictalurus punctatus*	X		
6	Blue Catfish	*Ictalurus furcatus*	X		
7	Flathead Catfish	*Pylodictis olivaris*	X		
8	Brown Bullhead Catfish	*Ameiurus nebulosus*	X		
9	Spotted Bullhead Catfish	*Ameiurus serracanthus*	X		
10	Alligator Gar	*Atractosteus spatula*	X		
11	Longnose Gar	*Lepisosteus osseus*	X		
12	Spotted Gar	*Lepisosteus oculatus*	X		
13	Rainbow Trout	*Oncorhynchus mykiss*	X	X	X
14	Brook Trout	*Salvelinus fontinalis*	X	X	X
15	Alabama Shad	*Alosa alabamae*	X	X	X
16	Threadfin Shad	*Dorosome petenense*	X		
17	Skipjack Herring	*Alosa chrysochloris*		X	X
18	Gulf Menhaden	*Brevoortia patronus*		X	X
19	Green Sunfish	*Lepomis cyanellus*	X		
20	Dollar Sunfish	*Lepomis marginatus*	X		
21	Redear Sunfish	*Lepomis microlophus*	X		
22	Bluegill	*Lepomis macrochirus*	X		
23	Redbreast Sunfish	*Lepomis auritus*	X		

Common Name		Scientific Name	F.W.	B.W.	S.W.
24	Largemouth Bass	*Micropterus salmoides*	X	X	
25	Smallmouth Bass	*Micropterus dolomieui*	X		
26	Redeye Bass	*Micropterus coosae*	X		
27	Rock Bass	*Ambloplites rupestris*	X		
28	Striped Bass	*Morone saxatilis*	X	X	X
29	White Bass	*Morone chrysops*	X	X	X
30	Black Crappie	*Pomoxis nigromaculates*	X		
31	White Crappie	*Pomoxis annularis*	X		
32	Walleye Pike	*Sander vitreus*	X		
33	Northern Pike	*Esox lucius*	X		
34	Redfin Pickerel	*Esox americanus*	X		
35	Yellow Perch	*Perca flavencens*	X		
36	Sauger	*Sander canadensis*	X		
37	Red Drum	*Sciaenops ocellatus*		X	X
38	Tarpon	*Megalops atlanticus*		X	X
39	Florida Pompano	*Trachinotus carolinus*		X	X
40	Cobia	*Rachycentron canadum*		X	X
41	Paddlefish	*Polyodon spathula*	X		
42	Bowfin	*Amia calva*	X		
43	Southern Flounder	*Paralichthys lethostigma*		X	X
44	Blue Tilapia	*Oreochromis aureus*	X	X	X
45	Mozambique Tilapia	*Oreochromis mossambicus*	X	X	X
46	Nile Tilapia	*Oreochromis niloticus*	X	X	
47	Redbreast Tilapia	*Tilapia rendalli*	X		
48	Alabama Sturgeon	*Scaphirhynchus suttkusi*	X		

	Common Name	Scientific Name	F.W.	B.W.	S.W.
49	Pacific White Shrimp	*Penaeus vannamei*		X	X
50	Blue Shrimp	*Penaeus stylirostris*		X	X
51	Pink Shrimp	*Pandalus borealis*		X	X
52	Giant River Prawn	*Macrobrachium rosenbergii*	X	X	X
53	American Sea Scallop	*Placopecten magellanicus*			X
54	Pimpleback Mussel	*Quadrula pustulosa*	X		
55	Pink Heelsplitter Mussel	*Potamilus alatus*	X		
56	Pistolgrip Mussel	*Tritogonia verrucosa*	X		
57	Blue Mussel	*Mytilus edulis*		X	X
58	Eastern Oyster	*Crassostrea virginica*		X	X
59	Olympia Flat Oyster	*Ostrea lurida*		X	X
60	Northern Quahog Clam	*Mercenaria mercenaria*		X	X

Aquaculture CDE District Tabulation Sheet

Participant	Event Phase (Maximum Score)		Participant Score	Total Score
Participant #1 **Individual Activities**	**Written Exam**	100 pts		
	Species Identification	100 pts		
	Fish Anatomy Identification	50 pts		
	Participant # 1's Total (Maximum score possible is 250 points)			
Participant #2 **Individual Activities**	**Written Exam**	100 pts		
	Species Identification	100 pts		
	Fish Anatomy Identification	50 pts		
	Participant # 2's Total (Maximum score possible is 250 points)			
Participant #3 **Individual Activities**	**Written Exam**	100 pts		
	Species Identification	100 pts		
	Fish Anatomy Identification	50 pts		
	Participant # 3's Total (Maximum score possible is 250 points)			
Participant #4 **Individual Activities**	**Written Exam**	100 pts		
	Species Identification	100 pts		
	Fish Anatomy Identification	50 pts		
	Participant # 4's Total (Maximum score possible is 250 points)			

TEAM RANKING	

TOTAL TEAM SCORE (TOP 3 participant scores will make up the team score. The maximum score possible is 750 points.)	

Aquaculture CDE State Tabulation Sheet

Participant	Event Phase (Maximum Score)		Participant Score	Total Score
Participant #1 **Individual Activities**	**Solution Concentrations**	50 pts		
	Feed Ratios	50 pts		
	Species Identification	200 pts		
	Team Activity	350 pts		
	Participant # 1's Total (Maximum score possible is 650 points)			
Participant #2 **Individual Activities**	**Solution Concentrations**	50 pts		
	Feed Ratios	50 pts		
	Species Identification	200 pts		
	Team Activity	350 pts		
	Participant # 2's Total (Maximum score possible is 650 points)			
Participant #3 **Individual Activities**	**Solution Concentrations**	50 pts		
	Feed Ratios	50 pts		
	Species Identification	200 pts		
	Team Activity	350 pts		
	Participant # 3's Total (Maximum score possible is 650 points)			
Participant #4 **Individual Activities**	**Solution Concentrations**	50 pts		
	Feed Ratios	50 pts		
	Species Identification	200 pts		
	Team Activity	350 pts		
	Participant # 4's Total (Maximum score possible is 650 points)			

TEAM RANKING	

TOTAL TEAM SCORE (4 participant scores will make up the team score. The maximum score possible is 2600 points.)	