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

(EVEN YEARS) Individual Practicums	Total Possible Points
Water Quality Testing	100 (x3)
Species Identification	200 (x3)
Solution Concentrations	50 (x3)
Feed Rate	50 (x3)
ID & Treatment of Diseases & Parasites (EVEN)	100 (x3)
Individual Total	**500**
(x#) indicates number of scores counted per chapter team	

(ODD YEARS) Individual Practicums	Total Possible Points
Water Quality Testing	100 (x3)
Species Identification	200 (x3)
Solution Concentrations	50 (x3)
Feed Rate	50 (x3)
Fish Anatomy & Physiology (ODD)	100 (x3)
Individual Total	**500**
(x#) indicates number of scores counted per chapter team	

Team Practicums	Total Possible Team Points
Construction of the Manifold	50 (x3)
Flow Rate	50 (x3)
Individual Total	**100**
Possible Team Total	**300**
(x#) indicates number of scores counted per chapter team	

EVEN YEARS				
	Group 1	**Group 2**	**Group 3**	**Group 4**
8am	Construction of Manifold	ID & Treatment of Diseases & Parasites Water Testing	Solution Concentrations & Feed Rate	Species Identification
9am	ID & Treatment of Diseases & Parasites Water Testing	Construction of Manifold	Species Identification	Solution Concentrations & Feed Rate
10am	Solution Concentrations & Feed Rate	Species Identification	Flow Rate	ID & Treatment of Diseases & Parasites Water Testing
11am	Species Identification	Solution Concentrations & Feed Rate	ID & Treatment of Diseases & Parasites Water Testing	Flow Rate

Students will rotate with their group. | Times of rotations will vary with start time of competition.

ODD YEARS				
	Group 1	**Group 2**	**Group 3**	**Group 4**
8am	Construction of Manifold	Fish Anatomy & Physiology Water Testing	Solution Concentrations & Feed Rate	Species Identification
9am	Fish Anatomy & Physiology Water Testing	Construction of Manifold	Species Identification	Solution Concentrations & Feed Rate
10am	Solution Concentrations & Feed Rate	Species Identification	Flow Rate	Fish Anatomy & Physiology Water Testing
11am	Species Identification	Solution Concentrations & Feed Rate	Fish Anatomy & Physiology Water Testing	Flow Rate

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 30-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 within a 20-minute time limit. 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 15).

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 Rate:** This is an individual event where 30 minutes will be given for the completion of this practicum. Given multiple scenarios about various ponds, 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. **Fish Anatomy and Physiology (odd years only):** Students will be given 30 minutes to identify various parts and provide information about their use, structure and abilities. The identification will take place on specimens which will have pins with #s in each organ to identify both internal and external anatomy. Students should be expected to identify 10 parts at 10 points each. Please refer to the catfish diagram on page 16.

    e. **ID and Treatment of Diseases and Parasites (even years only):** Students will be given 30 minutes to positively identify specific diseases or parasites affecting fish through a variety of scenarios and/or photographs. In some cases, students may also be asked to identify or explain appropriate treatments, management strategies, preventative measures, or solutions related to the disease or parasite identified. Students are expected to identify the fish health diseases and parasites listed on page 17.

    f. **Team Activity: Construction of Manifold & Flow Rate**
    Skills needed for this activity: tape measure, drill bit, tap, PVC glue, PVC Pipe cutter.
        - ⇒ Total Time: 2 hours
            - Rotations:
                - Rotation 1 (1 hour): 1-2 team members will build and assemble the manifold.

        - Rotation 2 (1 hour): The other 1-2 team members will set the flow rates on the manifold.
    - Valve Flow Rates: Each manifold has 2 valves. The valves must be adjusted to a different assigned flow rate.
    - Equipment: At the state contest, manifolds will connect to a water pump. For practice, a garden hose can be used if a water pump is not available.
    - Scoring: Teams receive 2 scores total: Construction Score (from Rotation 1) and Flow Rate Score (from Rotation 2). Paired members share the same score for this activity.
    - More Info: See the Diagram on page (18) for more guidance.

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.

Water Quality Testing

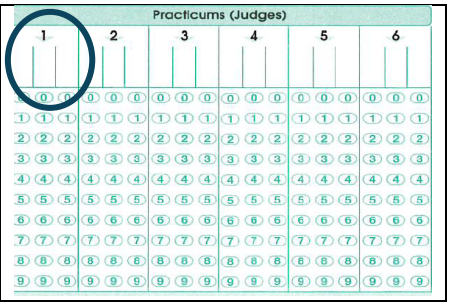
Students will use the LaMotte Freshwater Aquaculture Test Kit to determine water quality from a variety of different sources. Eight critical test factors can be efficiently and accurately determined on-site by students, including alkalinity, ammonia nitrogen, carbon dioxide, chloride, nitrite nitrogen, 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.

Aquaculture State Contest- Water Testing Station Examples

Scenario: The following water sample arrived at the E.W. Shell Fisheries Center today to be tested for pH and alkalinity. The grower has reported stunted growth of his catfish and an increase in algae blooms. The water sample was collected late yesterday afternoon and dropped off this morning. The grower said that the water temperature was 70 degrees Fahrenheit.

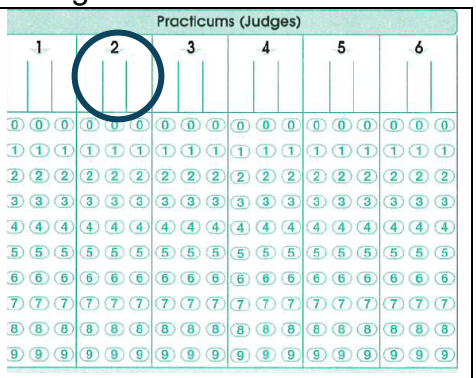
1. Measure the pH of the water sample and record it on the scantron under the practicum section on number 1.

Code	pH range
101	3.5 - 4.5
102	4.4 – 5.5
103	5.5 – 6.5
104	6.5 - 7.5
105	7.5 - 8.5
106	8.5 - 9.5



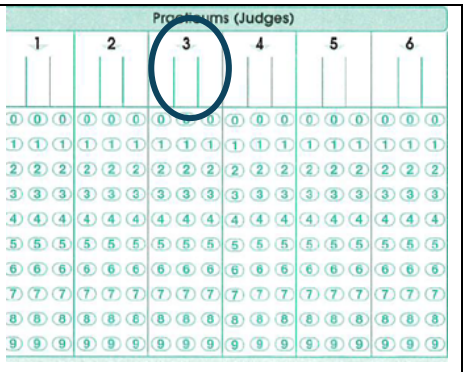
2. Based on the pH results what would you recommend the grower do?

Code	Management Practice
201	The pH is in an adequate range for catfish production and no changes should be made.
202	The pH is too low for catfish production and lime should be applied to increase pH.
203	The pH is too high, and you should add gypsum to lower the pH.
204	The pH is too low for catfish production and gypsum should be applied to increase pH.
205	The pH is too high, and you should add lime to lower the pH.



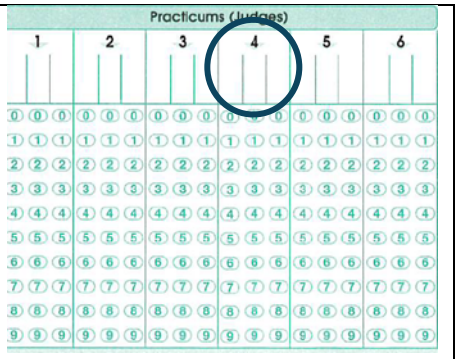
3. Measure the alkalinity of the water sample given and record it under number 3.

Code	Alkalinity range
301	25-40
302	40-55
303	55-70
304	65-80
305	80-95
306	95-110
307	110-125
308	125-140
309	> 140



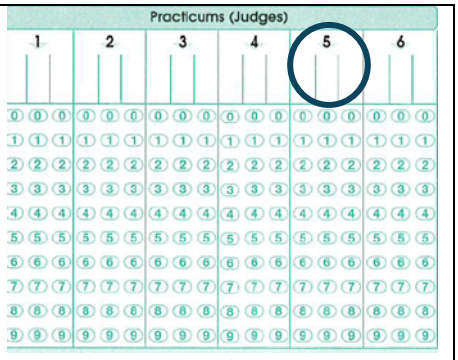
4. Based on the alkalinity of the water sample what management practice would you implement.

Code	Management Practice
401	The alkalinity is above the recommended range for catfish production therefore a liming material should be added to the pond.
402	The alkalinity is above the recommended range for catfish production therefore ammonium fertilizer should be added.
403	The alkalinity is within the recommended range for catfish production and no changes are needed.
404	The alkalinity is below the recommended range for catfish production therefore a liming material should be added to the pond.
405	The alkalinity is below the recommended range for catfish production therefore ammonium fertilizer should be added.



5. Based on the data you collected today which statement best describes the relationship between pH and alkalinity?

Code	Management Practice
501	The pH is low and has a high buffering capacity based on the alkalinity data.
502	The pH is low and has a low buffering capacity based on the alkalinity data.
503	The pH is neutral and has a high buffering capacity based on the alkalinity data.
504	The pH is neutral and has a low buffering capacity based on the alkalinity data.
504	The pH is high and has a high buffering capacity based on the alkalinity data.
505	The pH is high and has a low buffering capacity based on the alkalinity data.



Water Quality For Best Growth

	Temp	D.O. mg/l	pH Units	Alkalinity mg/l	CO2 mg/l	Un-Ionized Ammonia mg/l	Nitrite mg/l	Hardness mg/l	Chloride mg/l	Salinity ppt
Trout	45 - 68°F 7 - 20°C	5 - 12	5.5-8	50 - 250	0 - 20	0 - .02	0 - .2	50 - 350	0 - 1500	0 - 3
Hybrid Striped Bass	70 - 85°F 21 - 29°C	4 - 10	6 - 8	50 - 250	0 - 25	0 - .03	0 - .8	50 - 350	0 - 1500	0 - 3
Tilapia	75 - 90°F 24 - 32°C	3 - 10	6 - 8	50 - 250	0 - 30	0 - .04	0 - .8	50 - 350	0 - 5000	0 - 15
Goldfish/Koi	65 - 75°F 18 - 24°C	4 - 10	6 - 8	50 - 250	0 - 25	0 - .08	0 - .6	50 - 350	0 - 2000	0 - 4
Shrimp (Freshwater)	68 - 80°F 20 - 27°C	4 - 10	6.5 - 9	60 - 100	0 - 20	0 - .05	0 - .9	60 - 250	0 - 1500	0 - 3
Shrimp (Saltwater)	60 - 75°F 16 - 24°C	4 - 10	6 - 8.5	50 - 250	0 - 15	0 - .01	0 - .1	50 - 350	13,000 -	2 - 35
Minnows Shiners	60 -75°F 16 - 24°C	4 - 10	6 - 8	50 - 250	0 - 25	0 - .03	0 - .6	50 - 350	0 - 2500	0 - 5
Tropical Fish (Fresh Water)	72 - 84°F 22 - 29°C	4 - 10	6 - 8	50 - 250	0 - 20	0 - .03	0 - .9	50 - 350	0 - 2500	0 - 5

Solution Concentrations

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: **TT x** Radius^2 x Height = Volume *Radius is half of the tanks width

Oval Tank: (TT x Width A x Width B x Height) = Volume *A= Minor Axis / 2 B= Major Axis / 2

*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 ppt= 1 g/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 FINAL answers 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 = 29.922 gallons

29.922 gallons x 3.8 Liters= 113.704 Liters

85 ppm - 50 ppm = 35 ppm 35 ppm = 35 mg/L

113.6 Liters x 35 mg/L = **3,976 mg (4.0 grams)** 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) = 57,876.48 in^3 57,876.48 in^3 ÷ 231 in^3/gallon = 250.548 gallons

250.548 gallons x 3.8 Liters= 952.081 Liters

70 ppm - 25 ppm = 45 ppm 45 ppm = 45 mg/L

951.082 Liters x 45 mg/L = **42,843.6 mg (42.8 grams)** of sodium bicarbonate is needed to reach the target alkalinity

Aquaculture CDE – Solution Concentration Sample Problems

1. A rectangular aquarium measures 48" x 24" x 24" and has an actual alkalinity of 25 ppm as measured through testing. The target alkalinity is 175 ppm. How many grams of sodium bicarbonate need to be added to reach the target alkalinity?
   a. 58.5 grams
   b. 78.1 grams
   c. 68.2 grams
   d. 48.2 grams

2. A rectangular aquarium measures 27" x 32" x 20" and has an actual salinity of 9 ppt as measured through testing. The target salinity is 32 ppt. How many milligrams of salt need to be added to reach the target salinity?
   a. 5,532.2 grams
   b. 7,575.9 grams
   c. 6,538.0 grams
   d. 6,053.6 grams

3. A rectangular aquarium measures 18" x 18" x 20" and has an actual alkalinity is 37 ppm as measured through testing. The target alkalinity is 100 ppm. How many grams of sodium bicarbonate need to be added to reach the target alkalinity?
   a. 6,701.3 mg
   b. 6,721.1 mg
   c. 6,751.9 mg
   d. 6,715.6 mg

4. A cylindrical aquarium measures 62" wide x 32" high and has an actual salinity is 2.5 ppt as measured through testing. The target salinity is 12.5 ppt. How many grams of salt need to be added to reach the target salinity?
   a. 15,500.0 grams
   b. 23,705.2 grams
   c. 30,555.3 grams
   d. 15,884.5 grams

5. An Oval tank measures 32" tall x 60" along the major axis x 36" along the minor axes. and has an actual alkalinity is 10 ppm as measured through testing. The target alkalinity is 120 ppm. How many grams of sodium bicarbonate need to be added to reach the target alkalinity?
   a. 24.5 grams
   b. 98.2 grams
   c. 109.8 grams
   d. 90.5 grams

Feed Rate

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.

CALCULATIONS TO USE:

Total Weight of Sample / Total Number of Sample = Average Weight of Each Fish

Average Weight of Each fish x Total Number of Fish in Pond = Total Weight of Fish in Pond

Total Weight of Fish in Pond x 0.02 (2%) = Total Weight of Feed Per Day

AT THE END OF THE PREDETERMINED FEEDING PERIOD (usually 10 days)

Second Sample Total Weight / Total Number Sample = New Average Weight of Each Fish

New Average Weight of Each Fish x Total Number of Fish in Pond = New Total Weight of Fish in Pond

Daily Feed Rate x Number of Days Fed = Total Weight of Feed for Predetermined Feeding Period

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.

Aquaculture CDE – Feed Conversions Practice

Problem 1

You have a 2-acre pond with 20,000 fish in it. You take a sample of 200 fish and find that your total sample weighs 150 lbs. You want to feed 2% of your total fish weight per day.

1. How much does each fish in the sample weigh?
   a. 0.75 lbs. *
   b. 1.75 lbs.
   c. 0.95lbs.
   d. 0.90 lbs.

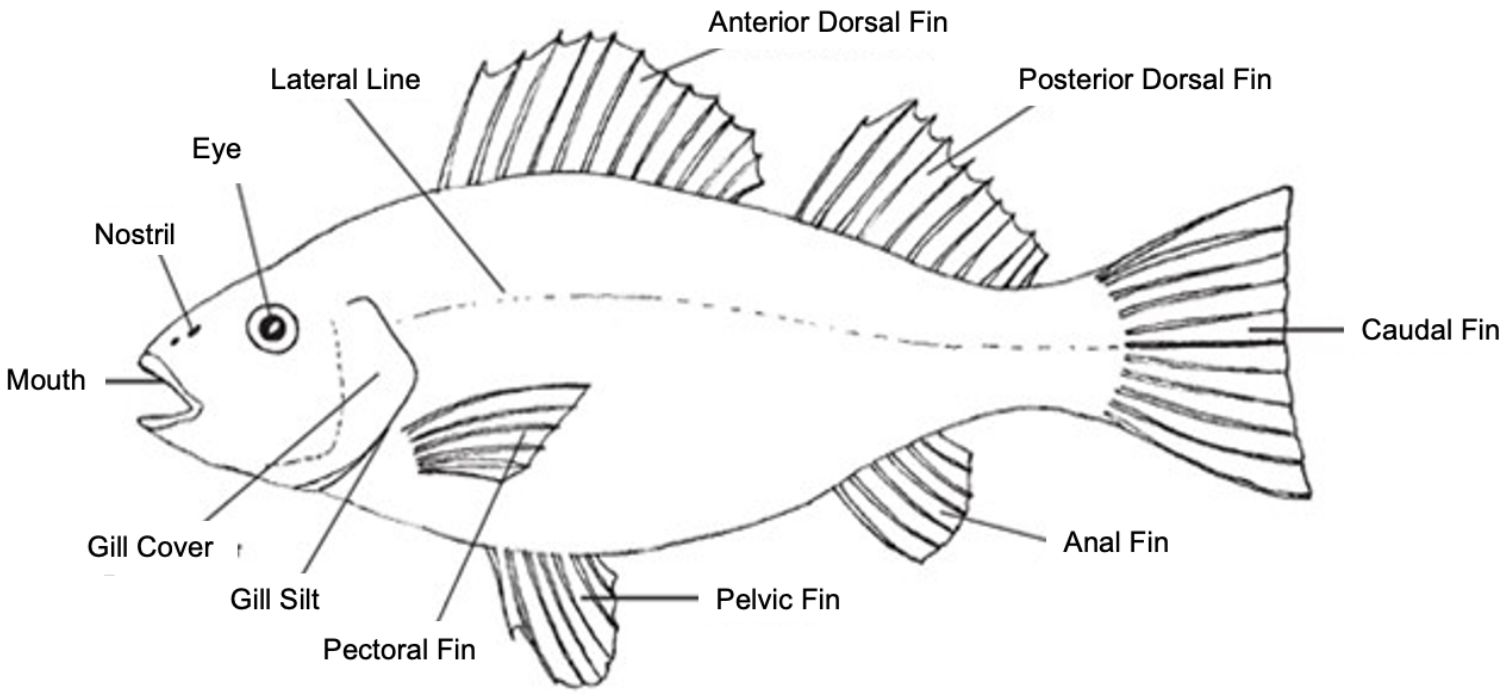
2. How many total pounds of fish are in the pond?
   a. 15,500 lbs.
   b. 26,650 lbs.
   c. 25,200 lbs.
   d. 15,000 lbs. *

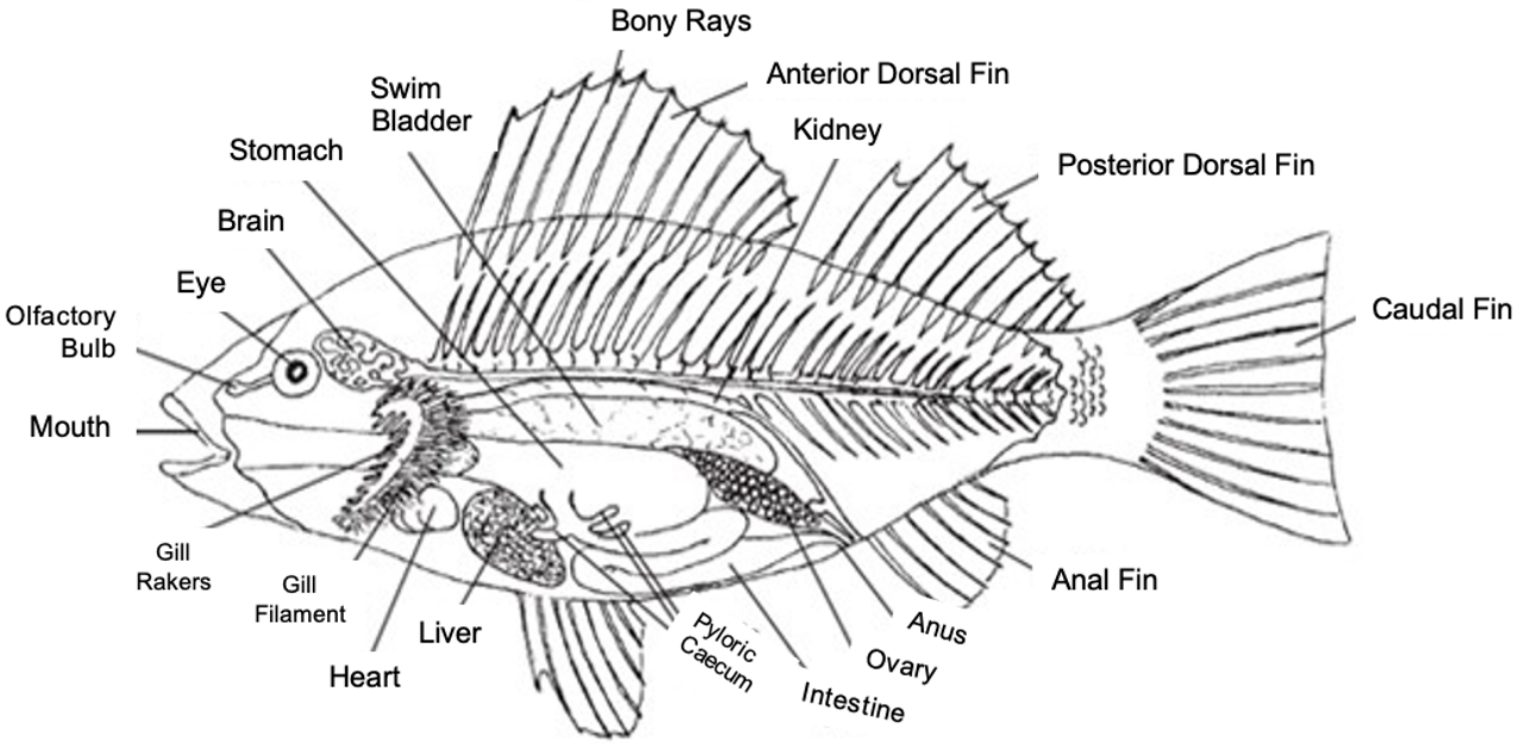
3. What is the daily feed rate for the pond?
   a. 375 lbs.
   b. 300lbs.*
   c. 340 lbs.
   d. 350 lbs.

4. After 10 days you sample again and find that your 200 fish sample now weighs 215 lbs. What is the new weight of the entire population?
   a. 22,600 lbs.
   b. 21,500 lbs. *
   c. 21,150 lbs.
   d. 30,100 lbs.

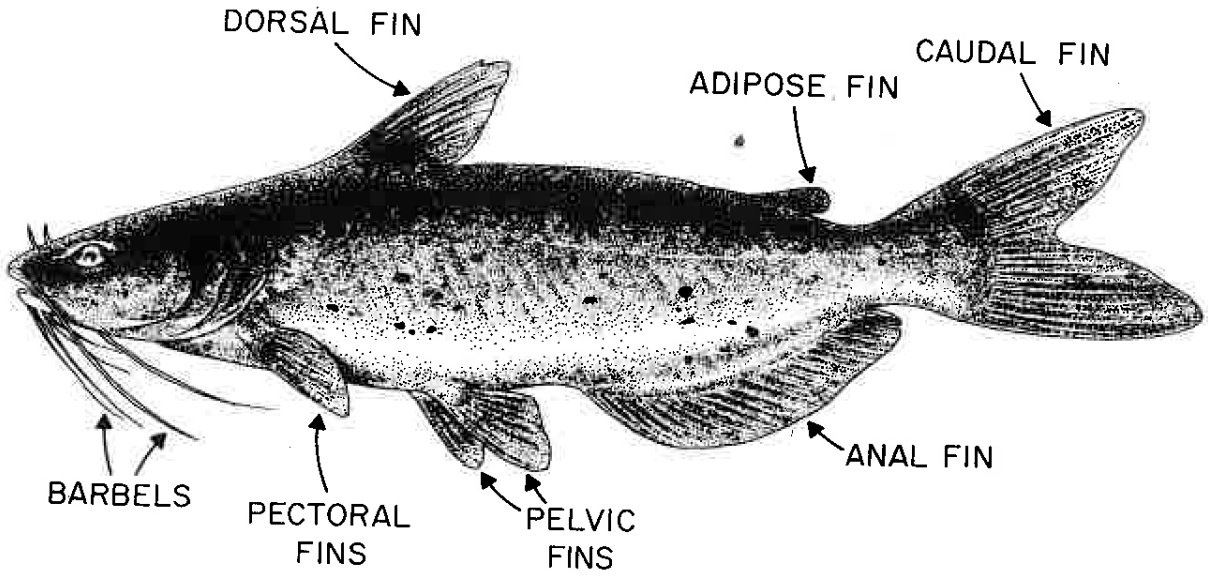
5. What would be the approximate total weight of food fed over the 10-day period?
   a. 3,000 lbs.*
   b. 2,000 lbs.
   c. 2,555 lbs.
   d. 3,540 lbs.

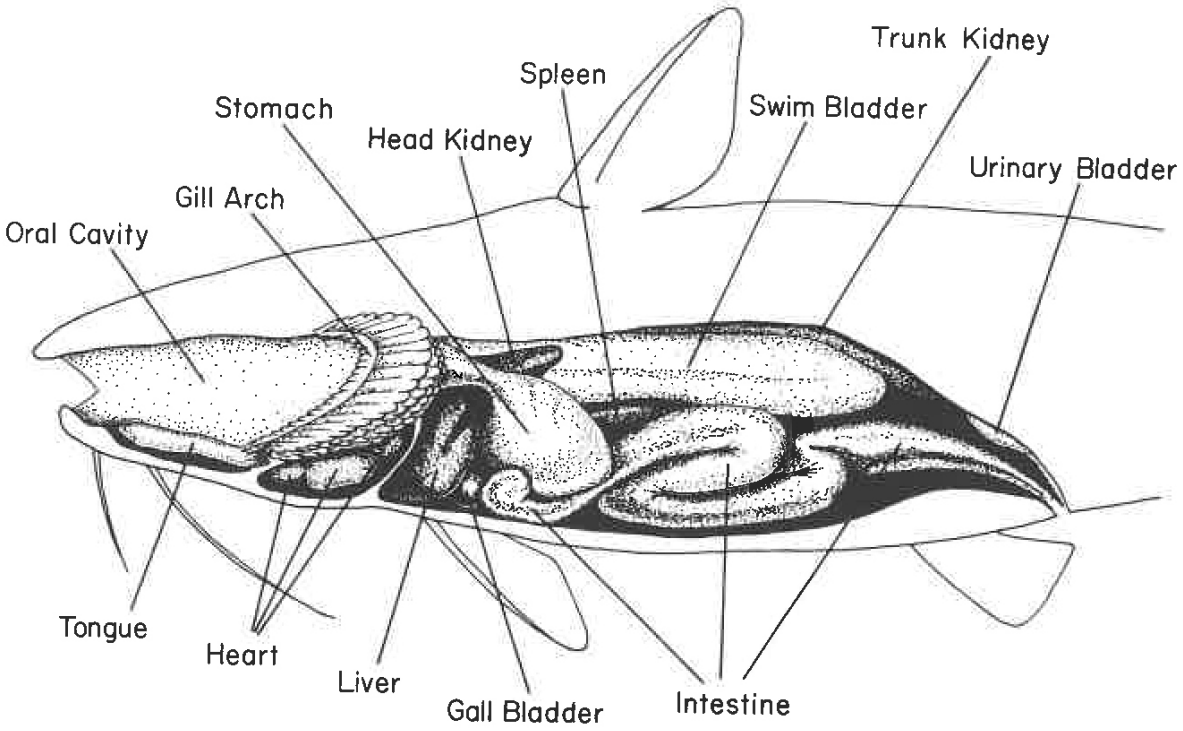
Fish Anatomy - Tilapia





Fish Anatomy - Catfish





Disease and Parasites

Students are expected to identify the fish health diseases and parasites listed below. Students will be asked to positively identify specific diseases or parasites affecting fish through a variety of scenarios and/or photographs. In some cases, students may also be asked to identify or explain appropriate treatments, management strategies, preventative measures, or solutions related to the disease or parasite identified.

Bacterial:

1. F. Columnaris
2. Edwardsiella ictaluri (Hole in the Head disease)
3. Aeromonas hydrophila
4. Streptococcal disease
5. Edwardsiella tarda

Parasitic:

1. Ichthyophthirius multifiliis (Ich)
2. Trichodina
3. Ichthyobodo (Costia)
4. Myxobolus cerebralis (Whirling Disease)
5. Proliferative gill disease
6. Argulus (Fish Lice)

Viral:

1. Channel Catfish Virus Disease

Fungal:

1. Saprolegnia

Non-Infectious:

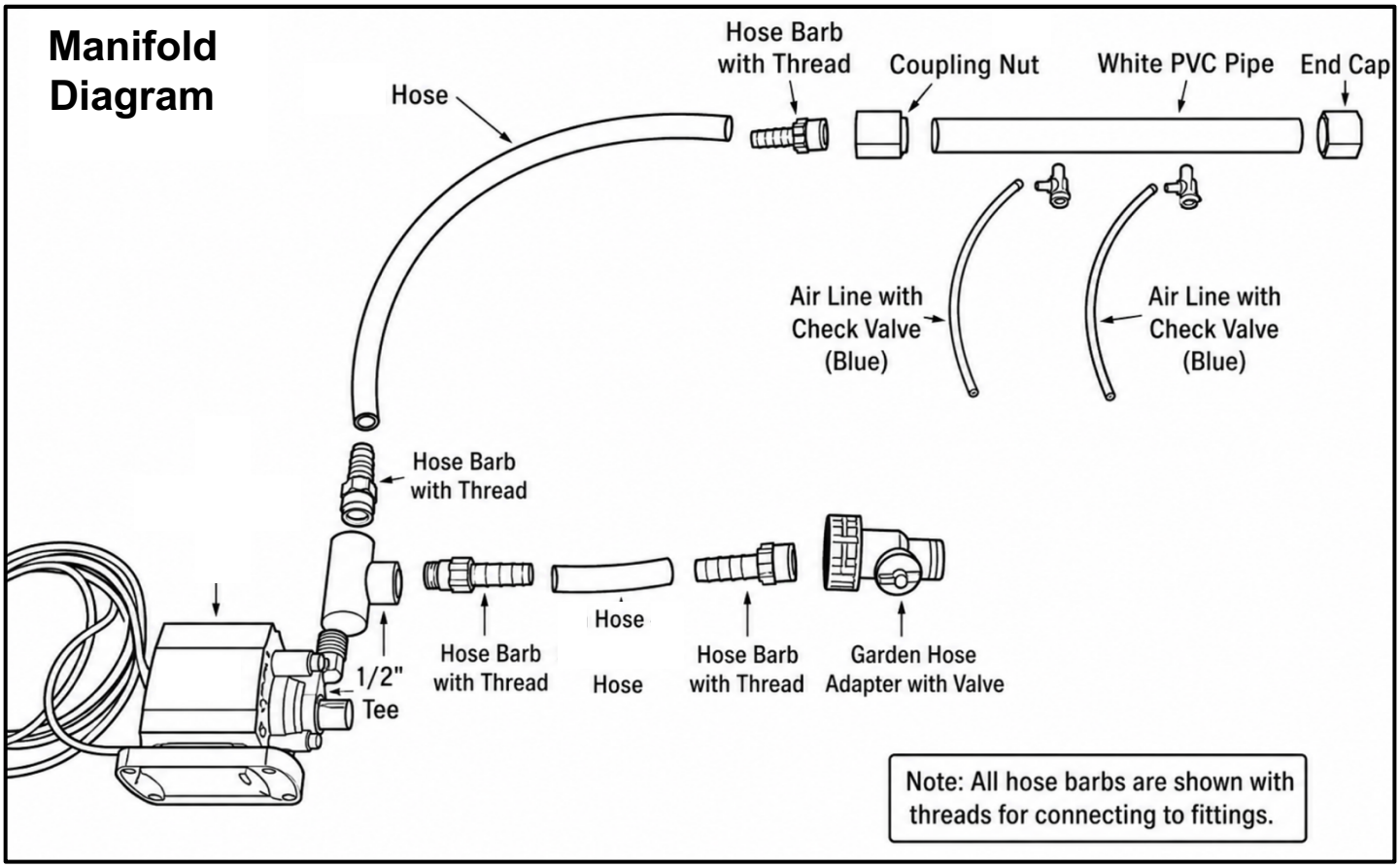
1. Swim Bladder Disease

2. Brown Blood Disease (nitrite poisoning)

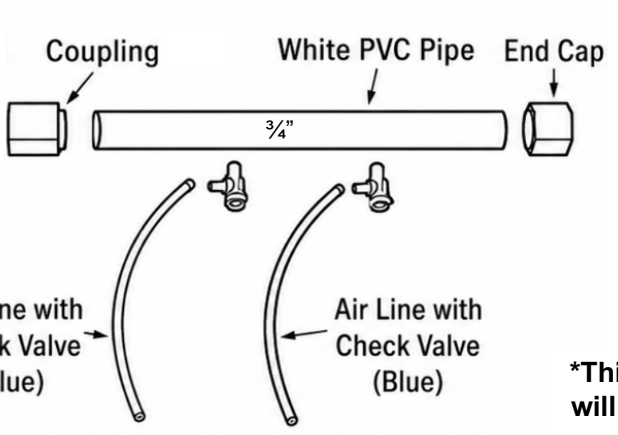
Team Activity Construction of Manifold & Flow Rate

Part 1 Team Activity Construction of the Manifold – 1 or 2 members of the team will be assigned to build the manifold in the first or second round of rotations. The length of the manifold and where the valves placement could change but this will be the overall design idea.

Manifold Diagram



Construction of Manifold



***This is the only section you will build for competition.**

Part 2 Team Activity Flow Rate – 1 or 2 members of the team will be assigned to test the flow rate in rotations 3 and 4. Students will get the manifold their team built in rotation 1 or 2 to determine flow rate. The flow rate will be predetermined prior to the start of the contest. Students will have 1 hour to fine tune the flow rate of the manifold. **Example: You will need to collect 100mL of water in 30 sec.**

Grading Criteria			
Manifold		**Flow Rate**	
Criteria	**Points**	**Criteria**	**Points**
Pipes cut to length	15 pts	Flow rate accuracy of outlet valve	50 pts
Valve placement	10 pts		
No leaks	10 pts		
Overall assembly	15 pts		
Total Points	50 pts		

*Lengths will be assigned for distances between all valves/gauges and fittings.

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)		Score	Total Score
Participant #1 **Individual Activities**	**Water Quality Testing**	100 pts		
	Species Identification	200 pts		
	Solution Concentrations	50 pts		
	Feed Rate	50 pts		
	ID & Treatment of Diseases & Parasites (EVEN)	100 pts		
	Fish Anatomy & Physiology (ODD)	100 pts		
	Participant # 1's Total	(Maximum score possible is 500 points)		

Participant	Event Phase (Maximum Score)		Score	Total Score
Participant #2 **Individual Activities**	**Water Quality Testing**	100 pts		
	Species Identification	200 pts		
	Solution Concentrations	50 pts		
	Feed Rate	50 pts		
	ID & Treatment of Diseases & Parasites (EVEN)	100 pts		
	Fish Anatomy & Physiology (ODD)	100 pts		
	Participant # 1's Total	(Maximum score possible is 500 points)		

Participant	Event Phase (Maximum Score)		Score	Total Score
Participant #3 **Individual Activities**	**Water Quality Testing**	100 pts		
	Species Identification	200 pts		
	Solution Concentrations	50 pts		
	Feed Rate	50 pts		
	ID & Treatment of Diseases & Parasites (EVEN)	100 pts		
	Fish Anatomy & Physiology (ODD)	100 pts		
	Participant # 1's Total	(Maximum score possible is 500 points)		

Participant	Event Phase (Maximum Score)		Score	Total Score
Participant #4 **Individual Activities**	**Water Quality Testing**	100 pts		
	Species Identification	200 pts		
	Solution Concentrations	50 pts		
	Feed Rate	50 pts		
	ID & Treatment of Diseases & Parasites (EVEN)	100 pts		
	Fish Anatomy & Physiology (ODD)	100 pts		
	Participant # 1's Total	(Maximum score possible is 500 points)		

Team Activities		Score	Score X 3
Manifold	**50 pts**		
Flow Rate	**50 pts**		
		Top 3 individual score total	
		Total Score max score possible = 1500	