

Aquaculture Career Development Event (State Only)

Revised January 2006

PURPOSE

The purpose of the aquaculture CDE is to promote the skills and knowledge of the aquaculture industry.

EVENT DESCRIPTION

The Aquaculture Career Development Event allows students to compete in various activities involved in the aquaculture industry. Fish identification, proper feeding, filleting techniques and building water systems are some of the components that event participants are tested on. This career development event is a prime example of the growing diversity in agriculture.

TEAM MAKE UP

A team will consist of four members. All four scores will count in determining the team score

I. OBJECTIVES

To test the student's ability to:

- use and understand aquaculture terms
- identify important species in the aquaculture industry
- recognize and use basic aquaculture equipment and instruments
- correctly determine feeds and feeding rates
- process fish according to industry standards

II. STANDARDS

1.1 9.8
9.4 29.2.4d

- Classify fish, shellfish, and crustacea in the aquaculture industry according to common and scientific names, warm/cold/salt water (habitat), feeding habits, and status (threatened, endangered or domesticated).
- Cut, thread, and assemble common materials utilized in the aquaculture industry.
- To test water for dissolved oxygen, pH, ammonia and tank inflow in liters per minute.
- To weigh fish and determine the correct feeding amount for a given tank.
- To clean, fillet and package a fish (tilapia, catfish or trout).

Aquaculture Career Development Event (State Only)

Revised January 2006

- Describe and identify management practices, diseases, equipment, facilities and production methods in the aquaculture industry.

III. GENERAL RULES

- A. A team will consist of four members. The team score will consist of the sum of all four participants' individual scores. Ties will be broken from written exam score.
- B. The event will consist of three parts: (a) written exam; (b) species identification exam; (c) practicums (one practicum for each team member).
- C. Scoring will be as follows:
 1. 50 question written exam **100 pts.** 30 minutes will be allowed for written exam. Questions for written exam will be taken from "Aquaculture" available from the :
Mid American Vocational Curriculum Consortium, Inc.
1500 West Seventh
Stillwater, Oklahoma 74074-4364.
 2. Species identification **100 pts.** 30 minutes will be allowed for species identification. (20 species selected randomly from a list of 55, 1 pt. ea. for common name, scientific name, habitat, feeding habits, and status). Arizona Game and Fish Educational Resources, (contact Kelly Burgett, Environmental Education Administrative Assistant, 2221 W. Greenway Road, Phoenix, Arizona 85023, phone (602) 789-3220, also library references and internet are suggested.
 3. Practicums (one per participant at 50 pts. each). Practicum should be selected in advance. Students will have 30 minutes to complete practicum. Practicums will consist of the following:
 1. Cutting, threading and assembling common materials used in the aquaculture industry. See detailed plans contained within.
 2. Preparing tilapia fillets and/or trout in the round. See attached score sheet.
 3. Testing of tank water for dissolved oxygen, pH, ammonia load, and liters per minute inflow. See attached score sheet.
 4. Given three fish to weigh and a tank consisting of 400 fish, to determine the correct feeding amount based on a rate of 2% of biomass. See attached score sheet.

Aquaculture

Career Development Event (State Only)

Revised January 2006

SPECIES IDENTIFICATION LIST

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
1. Brown Trout	Salmo trutta	Common
2. Brook Trout	Salvelinus fontinalis	Common
3. Smallmouth Bass	Micropterus dolomieni	Common
4. Northern Pike	Esox lucius	Common
5. Channel Catfish	Ictalurus punctatus	Domesticated
6. Apache Trout	Oncorhynchus apache	Threatened
7. Tilapia, mossambique	Oreochromis mossambicus	
8. Black Crappie	Pomoxis nigromaculatus	Common
9. White Bass	Morone chrysops	Common
10. Yellow Bass	Morone mississippiensis	Common
11. Bluegill	Lepomis macrarchus	Common
12. Green Sunfish	Chaenobryttus cyanellus	Common
13. Largemouth Bass	Micropterus salmoides	Common
14. Cutthroat Trout	Oncorhynchus clarki	Common
15. Rainbow Trout	Oncorhynchus mykiss	Common
16. Flathead Catfish	Pilodictus olivaris	Common
17. Striped Bass	Morone saxatilis	Domesticated
18. Walleye	Stizostedion vitreum	Common
19. Colorado Squawfish	Ptychocheilus lucius	Endangered
20. Virgin Chub	Gila seminuda	Endangered
21. Little Colorado Spinedace	Lepidomeda vittata	Threatened
22. Beautiful Shiner	Cyprinella formosa	Endangered
23. Sonora Chub	Gila ditaenia	Endangered
24. Loach Minnow	Rhinichthyhs cobitis	Threatened
25. Spikedace	Meda fulgida	Threatened
26. Desert Pupfish	Cyprinodon macularius	Endangered
27. Desert Sucker	Catostomus clarki	Common
28. Machete	Elops affinis	Common
29. Gila Trout	Oncorhynchus gilae	Endangered
30. Yaqui Catfish	Ictalurus pricei	Endangered
31. Striped Mullet	Mugil cephalus	Common
32. Gila Chub	Gila intermedia	Threatened
33. Roundtail Chub	Gila Robusta	Threatened
34. Bonytail	Gila elegans	Endangered
35. Little Colorado Sucker	Catostomus Sp.	Common
36. Flannelmouth Sucker	Catostomus latipinnis	Common
37. Yaqui Sucker	Catostomus bernardini	Endangered
38. Bluehead Sucker	Catostomus discobolus	Common

Aquaculture

Career Development Event (State Only)

Revised January 2006

39. Humpback Chub	<i>Gila cypha</i>	Endangered
40. Razorback Sucker	<i>Xyrauchen texanus</i>	Endangered
41. Yaqui Chub	<i>Gila purpurea</i>	Endangered
42. Woundfin	<i>Plagopterus argentissimus</i>	Endangered
43. Gila Topminnow	<i>Poeciliopsis o. occidentalis</i>	Threatened
44. Yaqui Topminnow	<i>Poeciliopsis o. sonoriensis</i>	Endangered
45. Mexican Stoneroller	<i>Campostoma ornatum</i>	Endangered
46. Virgin Spinedace	<i>Lepidomeda mollispinis</i>	Endangered
47. Longfin Dace	<i>Agosia chrysogaster</i>	Common
48. Sonora Sucker	<i>Catostomus insignis</i>	Common
49. Crayfish, white	<i>Cambarus diogenes</i>	Common
50. Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Common
51. Zebra Danio	<i>Brachydanio redo</i>	Common
52. Sailfin molly	<i>Poecilia latipinna</i>	Common
53. Nile Tilapia	<i>Oreochromis niloticus</i>	Domesticated
54. Tiger Barb	<i>Capoeta tetrazona</i>	Common
55. Guppy	<i>Poecilia reticulata</i>	Common
56. Clown Loach	<i>Botia macracantha</i>	Common
57. American Shad	<i>Alosa sapidissima</i>	Common
58. Atlantic Salmon	<i>Salmo Salar</i>	Domesticated
59. Australian Blowfish	<i>Torquigener pleuogramma</i>	Common
60. White Shrimp	<i>Litopenaeus vannamei</i>	Domesticated
61. Neon Tetra	<i>Paracheirodon innesi</i>	Common
62. Paradise Fish	<i>Macropodus operculus</i>	Common
63. Angelfish	<i>Pterophyllum scalare</i>	Common
64. Goldfish	<i>Carassius auratus</i>	Common
65. Red Swamp Crawfish	<i>Procambarus clarki</i>	Domesticated

Aquaculture Career Development Event (State Only)

Revised January 2006

Name _____

School _____

Participant ID Number _____

Practicum Test for Water Analysis

Complete the following tests on the tank provided and record your answers on this sheet. You may use your own equipment or the equipment provided. Remember to adjust DO meters for Tucson altitude which is approximately 2500 feet. You have 30 minutes to complete the event.

<u>Test</u>	<u>Answer</u>	<u>Score</u>
Dissolved oxygen in ppm (10)	_____	_____
Ammonia Load in ppm (10)	_____	_____
ph (10)	_____	_____
water inflow in liters per minute (10)	_____	_____
Proper knowledge of equipment (10)	_____	_____
		Total _____

Aquaculture Career Development Event (State Only)

Revised January 2006

PRACTICAL TEST -- DETERMINING 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 half way with water and weigh it using the balance. Remember, if you use counter weights, you must add them to the total weight obtained.

STEP 2 -- Carefully remove 3 fish from a tank and place them in water. Add weight until the balance is centered. 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:

$$.025 \left(\frac{A+B+C}{3} \right) N = X$$

.025 = the percentage of biomass we feed (2.5%). A+B+C = each individual weight of the fish. 3 the total number of fish weighed. N the total number of fish in the tank. X the amount of feed needed per day.

NOTE: This formula must be memorized prior to event. There is 50 points possible for this practicum (5 points for each step performed correctly and 25 points for the correct answer.) The breakdown is as follows:

Steps 1-4 performed correctly for up to 20 points. Formula used correctly for 5 points. Correct answer for 25 points.

Aquaculture Career Development Event (State Only)

Revised January 2006

Practical Test - Process and Package a Trout

Name _____

School _____

Date _____

Evaluator's Name _____

Attempt no. _____

PROCESS EVALUATION

(EVALUATOR NOTE: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. All items listed under "Process Evaluation" must receive a "Yes" for the student to receive the 20 points for this practicum.)

The student:

	Yes	No
1. Prepared ice bath.	1. <input type="checkbox"/>	<input type="checkbox"/>
2. Removes scales or skin as required.	2. <input type="checkbox"/>	<input type="checkbox"/>
3. Cleaned gut and gill cavities properly	3. <input type="checkbox"/>	<input type="checkbox"/>
4. Placed fish in ice bath.	4. <input type="checkbox"/>	<input type="checkbox"/>
5. Packaged weighed and labeled fish (date and weight).	5. <input type="checkbox"/>	<input type="checkbox"/>
6. Properly discarded waste and cleaned equipment.	6. <input type="checkbox"/>	<input type="checkbox"/>

Evaluator's comments:

Aquaculture Career Development Event (State Only)

Revised January 2006

PRODUCT EVALUATION

(EVALUATOR NOTE: Rate the student on the following criteria by circling the appropriate numbers (See performance evaluation key below.) Add up the total numbers circled and enter the total score from this page in the space provided below.)

Criteria:

Scrubbing and Gutting	Complete 4	Acceptable 3	Poor 2	Unacceptable 1
Product Preparation	Neat 4	Acceptable 3	Poor 2	Unacceptable 1
Packaging and Weighing	Complete 4	Acceptable 3	Fair 2	Unacceptable 1

EVALUATOR'S COMMENTS:

PERFORMANCE EVALUATION KEY

- 4 – Skilled
- 3 - Moderately skilled
- 2 – Limited skill
- 1 – Unskilled

Total Points from this page: _____

Add 20 only if all "Yes" boxes are checked on previous page: _____

Total score: _____

Aquaculture
Career Development Event (State Only)

Revised January 2006

Practical Test - Fillet and Package a Tilapia

Name _____

School _____

Date _____

Evaluator's Name _____

Attempt no. _____

PROCESS EVALUATION

(EVALUATOR NOTE: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. All items listed under "Process Evaluation" must receive a "Yes" for the student to receive the 20 points for this practicum.)

The student:

	Yes	No
1. Prepared ice bath.	1. <input type="checkbox"/>	<input type="checkbox"/>
2. Prepared fillets and trimmed.	2. <input type="checkbox"/>	<input type="checkbox"/>
3. Put fillets in ice bath for proper length of time (15-30 minutes).	3. <input type="checkbox"/>	<input type="checkbox"/>
4. Placed fillets in air-free freezer bag	4. <input type="checkbox"/>	<input type="checkbox"/>
5. Weighed and labeled fillets (Date and weight).	5. <input type="checkbox"/>	<input type="checkbox"/>
6. Properly discarded waste and cleaned equipment.	6. <input type="checkbox"/>	<input type="checkbox"/>

Evaluator's comments:

Aquaculture Career Development Event (State Only)

Revised January 2006

PRODUCT EVALUATION

(EVALUATOR NOTE: Rate the student on the following criteria by, circling the appropriate numbers (See performance evaluation key below.) Add up the total numbers circled and enter the total score from this page in the space provided below.)

Criteria:

Preparation	Complete 4	Acceptable 3	Poor 2	Unacceptable 1
Filet Preparation	Neat 4	Acceptable 3	Poor 2	Unacceptable 1
Packaging and	Complete 4	Acceptable 3	Fair 2	Unacceptable 1

EVALUATOR'S COMMENTS:

PERFORMANCE EVALUATION KEY

- 4 – Skilled
- 3 - Moderately skilled
- 2 – Limited skill
- 1 – Unskilled

Total Points from this page: _____

Add 20 only if all "Yes"
boxes are checked on
previous page: _____

Total score: _____