

- Description:** The module consists of the following four problem areas:
- Module:** Ornamental/Tropical Fish
- Problem Areas:** Determining Opportunities in Ornamental/Tropical Fish Aquaculture  
Determining Requirements for Raising Ornamental/Tropical Fish  
Reproducing Ornamental/Tropical Fish in Tanks  
Identifying Ornamental/Tropical Fish Disease Prevention and Health Care
- Objectives:** The objectives for each problem area are given below.

- A. Determining Opportunities in Ornamental/Tropical Fish Aquaculture
- describe scope and economic importance of tropical fish industry
  - locate major tropical fish producing regions of the world
  - identify occupational opportunities in tropical fish industry
  - locate more information about tropical fish aquaculture
- B. Determining Requirements for Raising Ornamental/Tropical Fish
- describe different habitats and systems of ornamental fish
  - identify equipment to establish aquarium for tropical fish
  - use tropical fish characteristics to select species
  - identify environmental requirements for producing and managing tropical fish
  - identify food requirements and sources for selected tropical fish
- C. Reproducing Ornamental/Tropical Fish in Tanks
- identify species for breeding ornamental fish
  - identify breeding procedures for specific species of tropical fish
  - list tank requirements for breeding tropical fish
  - perform procedures to insure success in breeding
  - care and feed young to insure their survivability
- D. Identifying Ornamental/Tropical Fish Disease Prevention and Health Care
- identify conditions that cause disease in tropical fish
  - identify management practices that prevent disease in tropical fish
  - identify symptoms of disease in tropical fish
  - determine treatments for specific diseases of tropical fish

# Aquaculture Curriculum Guide

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## Teaching Plan:

**Module:** Ornamental/Tropical Fish - Section A

**Problem Area:** Determining Opportunities in Ornamental/Tropical Fish Aquaculture

**Estimated Time:** 1-2 hours

**Goal:** The goal of this problem area is to learn the status of tropical fish aquaculture and occupational opportunities.

**Learning Objectives:** Upon completing this problem area, students will be able to:

- describe scope and economic importance of tropical fish industry
- locate major tropical fish producing regions of the world
- identify occupational opportunities available in the tropical fish industry
- locate more information about tropical fish aquaculture

**Resources:** The following resources are needed to complete this problem area:

### Essential:

Transparencies, world map or globe.

**Aquarium Fish**, by Ulrich Schliewen, Barron's Educational Series, Inc., 250 Wireless Boulevard, Hauppauge, NY, 1992.

### Additional:

**Aquarium Fish Magazine**; see references on page 158 and compare how these sources are similar to the more traditional animal production enterprises.

### Practical Fishkeeping Magazine.

Any general reference on tropical fish aquaculture.

**Content and Procedures**

**Preparation (Interest Approach):**

Use TM A1 to present objectives.

To develop student interest in this module, lead students into thinking about the importance of the tropical fish industry. Ask if any of them have pets. Ask students to identify what type of pets they have. Record on board. You should end up with dogs, cats, tropical fish, hamsters, etc. For those who don't have pets, ask them to think about a friend or relative who does. Have students tell what was their first pet. This is often tropical fish. Why? The reasons may be ease of care, relative low cost to start and maintain, low risk - no dog bites, accidents on carpets, or animal running away. Because of these reasons, tropical fish are very popular and demand is high. Lead discussion into the objectives for the problem area.

**Presentation**

**A. What is ornamental/tropical fish aquaculture?**

**Use TM A2 to give a definition of tropical fish aquaculture.**

1. Ornamental aquaculture, or tropical fish raising, is the culture and management of fish for purposes other than for food. Fish are kept in a tank, aquarium, or sometimes an outdoor pond.
2. The purposes of raising or having tropical fish are similar to other hobbies, i.e., for productive use of leisure time, ability to work with nature, and to provide a pleasant scene.

**B. What is the history of ornamental aquaculture?**

Review with students the history of aquaculture that was presented earlier in the course.

1. Raising fish for ornamental purposes follows the development of aquaculture for food purposes.
2. Additional species of fish were kept not because of their food quality, but because of unusual characteristics such as size, shape, and most importantly color.
3. Raising and keeping tropical fish in this country has long been a popular hobby and the interest the general public has in aquatic animals can be illustrated by the popularity of large aquariums such as the Shedd Aquarium in Chicago, Illinois, and aquatic theme parks such as Sea World.
4. Today, raising tropical fish is as popular as ever as evidenced by the abundance of pet stores that sell tropical fish and specialty stores that cater solely to tropical fish enthusiasts.

**C. Where are tropical fish produced?**

**Show TM A3 to show sources of tropical fish in the world or use a globe or large flat world map.**

1. Either they are caught in the wild or they are farmed.
2. The major producers of tropical fish include the Pacific Rim countries of southeast Asia (Philippines, Thailand, Hong Kong), the United States, and some European countries like Germany and Holland.
3. The major sources of tropical fish are Africa, Central and South America, and the Southeast Pacific.

**D. Where are tropical fish produced in the United States?**

**Ask students to describe the climate and topography that must be present in Florida to make it ideal for outdoor tropical fish production .**

1. Florida is major producer of tropical fish in the United States.
2. Climate and topography are very favorable to outdoor pond culture.
3. As culture of fish moves to indoor recirculating systems, tropical fish will be able to be grown anywhere.
4. First-time survey in 1987 by the Agricultural Statistics Service of tropical fish production in Florida revealed 193 growers; sales of \$21.7 million; centered in Hillsborough and Polk counties.
5. Half of tropical fish bought in United States are imported.

### **E. What occupations are related to the tropical fish industry?**

**Use TM A4 to list the occupations related to tropical fish aquaculture.**

1. Producers/breeders.
2. Importers/brokers.
3. Pet store/tropical fish specialty store owners/employees.
4. Wholesalers who get fish from brokers/importers to retailers.
5. Supplies and service for both the producers/breeders and retailers, including supplies and services for aquarium hobbyists.
6. Specialty areas:
  - a. Aquascaping (the use of aquariums for interior decorating, especially offices and restaurants) for indoor and outdoor settings.
  - b. Veterinarian specializing in aquatic animals.

Review:

Review by having students demonstrate their knowledge and understanding of the objectives. This can be done by asking key questions such as the following: How does tropical fish aquaculture differ from food aquaculture? How did tropical fish aquaculture develop? Why do people keep tropical fish? How can we tell that raising tropical fish is an important hobby? What types of jobs are available in the tropical fish industry? Is information available about keeping tropical fish?

### **Application Activities:**

Application can be achieved by having students locate pet stores and specialty shops in their area that sell tropical fish. Visit these stores and make an inventory of supplies and services that are available to tropical fish hobbyists. Write to various magazines and specialty societies asking for information and complimentary copies of their literature.

### **Evaluation:**

Evaluations should focus on the extent to which students achieved the objectives of the problem area. Example exam questions are attached.

## Objectives

- Describe tropical fish industry.
- Locate major tropical fish producing regions of the world.
- Identify occupational opportunities in tropical fish aquaculture.
- Locate resources for obtaining additional information.

## Tropical Fish Aquaculture

- Culture and management of fish for purposes other than for food
- Fish kept in a tank, aquarium, or pool for the enjoyment of viewing
- Purposes are similar to other hobbies:
  - Productive use of leisure time
  - Ability to work with nature
  - Provide a pleasant scene

## Sources of Tropical Fish

- Producers:
  - Pacific Rim countries
  - United States
  - Europe
- Sources in the Wild:
  - Africa
  - Central and South America
  - Southeast Pacific

## Occupations in the Tropical Fish Industry

- Producers/breeders
- Importers/brokers
- Pet specialty store owners/employees
- Wholesalers
- Supplies and service
- Aquascaping
- Veterinarian

Quiz for Section A

Name:

Date:

Quiz on Determining Opportunities in Ornamental/Tropical Fish Aquaculture

1. Define tropical fish aquaculture.
2. Explain how raising tropical fish is similar to other hobbies such as gardening or painting.
3. Which state is a major tropical fish producer? a. California b. Texas c. Mississippi d. Florida
4. What percentage of tropical fish bought in the United States is imported? a. 10% b. 25% c. 50% d. 75%
5. Name two Pacific Rim countries that produce tropical fish:  
\_\_\_\_\_ and \_\_\_\_\_.
6. List four occupations related to tropical fish aquaculture:  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

### Key for Quiz - Section A

1. Define tropical fish aquaculture.

**Culture and management of tropical fish for purposes other than for food. Fish are kept most often in an aquarium but can be kept in an outdoor pool or pond for viewing for pleasure.**

2. Explain how raising tropical fish is similar to other hobbies such as gardening or painting.

**Productive use of leisure time, ability to work with nature, provide a pleasant scene or area.**

3. Which state is a major tropical fish producer? **d. Florida**

4. What percentage of tropical fish bought in the United States is imported? **c. 50**

5. Name two Pacific Rim countries that produce tropical fish.

**Philippines, Thailand, Hong Kong**

6. List four occupations related to tropical fish aquaculture:

**Producers/breeders, importers/brokers, retailers/wholesalers  
supplies and services, aquascaping, veterinarian**