



## Making Fish Prints<sup>1</sup>

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### Objectives

Participating young people and adults will:

1. Review external anatomy of fish
2. Identify characteristics of fishes being printed
3. Relate form to function in external anatomy
4. Have fun while learning.

### Roles for Teen and Junior Leaders

1. Assist with teaching area set up and break down
2. Demonstrate fish printing
3. Assist members as needed
4. Lead discussion of anatomy and function
5. Assist with labeling as desired

### Potential Parental Involvement

1. See ARoles for Teen and Junior Leaders@ above
2. Arrange for or provide teaching space
3. Arrange for or provide teaching materials
4. Arrange for or provide fish for printing

### Youth Development Objectives

Participating young people will:

1. Enhance hand-eye coordination
2. Enhance fine motor skills
3. Expand science awareness
4. Relate form and function in living things
5. Practice cooperation

### Evaluation Suggestions

1. Observe group behavior and interactions

**Best Time:** Following a fishing experience or as an introduction or summary activity for a fish anatomy lesson

**Best Location:** Anywhere comfortable location where paint spills will not be a problem

### Equipment/Materials

Fish banners or pictures  
 whole clean fish  
 newspaper  
 large soft paint brush about one inch wide  
 paint containers (plastic dishes, pie pans, or baby food jars (number needed depends on the number of colors you will be using.)  
 markers  
 tempera paint  
 Fish T-shirts  
 acrylic paint  
 permanent clothing additive  
 hangers  
 permanent markers

### References

*Aquatic Sampling*. NY SAREP Program Manual. Edelstein K. L. and B. E. Matthews.1993. Cornell University: Ithaca, NY. 75 pp.

*Nature Crafts for Kids. Fish Print.* Krautwurst

<sup>1</sup> Adapted from multiple sources

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2. Observe ability to follow simple directions  
 3. Observe ability to relate anatomy to function

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*Fishes: an introduction to ichthyology.* 3rd ed. Moyle, P. B. and J. J. Cech Jr., 1996.. New Jersey. Prentice-Hall, Inc. pp 18-20.

### Safety Considerations

Be careful of younger youth putting paint into their eyes and mouths.  
 Make sure following this activity youth wash their hands.

### Lesson Outline

Presentation	Application
<p>I. Introduction</p> <ul style="list-style-type: none"> <li>A. Preparing the fish</li> <li>B. Painting the fish</li> <li>C. Printing the fish</li> <li>D. Labeling the fish</li> <li>E. Finishing the banner</li> </ul> <p>II.. Preparing the fish for printing</p> <ul style="list-style-type: none"> <li>A. Removing the slime               <ul style="list-style-type: none"> <li>1. Mild vinegar solution</li> <li>2. Wiping with a cloth or paper towel</li> <li>3. Making a couple of prints</li> </ul> </li> <li>B. Painting the fish               <ul style="list-style-type: none"> <li>1. Work from head to tail</li> <li>2. Leave fins and eyes paint less for now</li> <li>3. Apply a very thin layer of paint                   <ul style="list-style-type: none"> <li>a. Less is generally better</li> <li>b. Thin as required</li> </ul> </li> <li>4. Paint fins and tail last</li> </ul> </li> </ul> <p>II. Printing the fish</p> <ul style="list-style-type: none"> <li>A. Moving the fish               <ul style="list-style-type: none"> <li>1. Avoid smearing the paint</li> <li>2. Position the fish to show features</li> </ul> </li> <li>B. Making the print               <ul style="list-style-type: none"> <li>1. Lay printing material gently on fish                   <ul style="list-style-type: none"> <li>a. Newsprint</li> <li>b. Dampened rice paper</li> <li>c. Tee-shirt with newsprint liner</li> </ul> </li> <li>2. Press printing material firmly against fish                   <ul style="list-style-type: none"> <li>a. Caution to avoid moving the material</li> <li>b. Need to contact all parts of the fish</li> </ul> </li> </ul> </li> <li>C. Removing the print from the fish               <ul style="list-style-type: none"> <li>1. Peel printing material away from fish with a smooth motion</li> </ul> </li> </ul> <p>2. Fill in eye with a small brush, avoiding smearing wet paint or ink</p>	<p>Fish prints are an excellent way to save a memory of a fishing trip with a special picture. Anyone can learn to make a fish print, and the fish can still be eaten if it is kept fresh and non-toxic inks or paints are used. Individuals may select their own fish or a couple selected specimens may be used.</p> <p>Coarse scaled fish often make more interesting prints, but all slime must be removed. Use a mild vinegar solution to rinse the fish and dry it with a paper towel or cloth. Several treatments may be required.</p> <p><b>DEMONSTRATE</b> the fish painting process. <b>EMPHASIZE</b> using a thin coat of paint applied from the head toward the tail. Be sure the fish is placed on a protective surface to catch extra paint or drips.</p> <p><b>PAINT</b> the fins and tail last, just before printing. <b>EMPHASIZE</b> the importance of keeping the paint thin and the coverage light. There is a strong tendency to apply too much paint.</p> <p><b>DEMONSTRATE</b> moving the fish to a clean, dry piece of newsprint, keeping the painted side up. This prevents having extra spots of paint on the finished print. <b>NOTE</b> the need to work rather quickly to avoid letting the paint dry on the fish.</p> <p><b>DEMONSTRATE</b> the use of several printing media, allowing the youngsters to select the type they wish to have. While rice paper is more expensive, it makes a more permanent and artistic print. <b>CAUTION</b> shirt printers to insert a layer of newsprint between the layers of the shirt to prevent strike-through of the paints.</p> <p><b>NOTE</b> that over-handling can result in smearing the print, but that full contact is needed to get all parts printed.</p> <p>Slowly and smoothly <b>PEEL</b> the printing material away from the fish. <b>AVOID</b> sliding the material across the fish body.</p> <p>3. <b>USE</b> a small brush to fill in the eye on the print.</p>

Sign prints to avoid confusion

4. Set aside or hang securely until dry
- D. Preparing the fish for the next print
  1. Prints often improve with use
  2. Remove paint and dry thoroughly

A little extra time here will prevent possible misunderstandings or confusion later.

### III. Labeling the print

#### A. Why label?

1. Increase knowledge of fish characteristics
2. Identification of unknown fishes
3. Label to meet objectives
  - a. Fish biology and anatomy
  - b. Fish art and trophies

**USE** regular markers to label prints or banners and fabric pens to label shirt material.

**NOTE** that labels can be used for many purposes, from simple identification and dating of artistic prints or trophies to scientific or educational labels of external anatomy. The latter creates a learning aid to enhance knowledge of fish characteristics and function.

#### B. External anatomy and function

##### 1. Median fins

**REVIEW** the median fins found on the fish being used in the exercise. **NOTE** that their names come from Latin or Greek names for the location or composition of the fin. For example, dorsal means Aback@, caudal means Atail@ and anal means Anear the anus@, while adipose means Afatty. @

##### a. Dorsal fin(s)

- 1) Spiny dorsal
- 2) Soft dorsal
- 3) Functions
  - a) stability in the water
  - b) positioning
  - c) communication

**NOTE** that the dorsal fins can be of different types. Spiny dorsal fins have hard spines supporting the membrane, while soft dorsal fins have softer rays supporting the membrane. Both types are used for stability, minor position adjustments, and communication. **ASK** what type of dorsal fins are present and how many spines are present on the specimen fish.

##### b. Caudal fin

- 1) Tail fin
- 2) Many types and shapes
  - a) Homocercal
  - b) Heterocercal
- 3) Function - propulsion

**NOTE** types of caudal fins if appropriate to the audience. Homocercal (equal top and bottom) tails are nearly equally divided by the fish's spine, while the spine extends into the upper lobe of a heterocercal (unequal top and bottom) tail. Also **NOTE** that primary propulsion is by this fin.

##### c. Anal fin

- 1) Variable in type and shape
- 2) Primary function - stabilization

**NOTE** the location behind the anal opening and that the primary function is similar to the dorsal fin -- stability and attitude adjustment in the water.

##### d. Adipose fin

**NOTE** that the function of the fatty tab-like fin is not clearly known, although it may be important for movement in fry. Adipose fins are present in only a few families.

##### 2. Paired fins

##### a. Primary steering fins in motion

- 1) Vertical movement
- 2) Horizontal movement

##### b. Pectoral fins

- 1) Shoulder fins or arms
- 2) Right behind operculum

##### c. Pelvic fins

- 1) Hip fins or Alegs@
- 2) Locations vary
  - a) Throat area - jugal
  - b) Chest area - thoracic
  - c) Abdominal area - abdominal

**NOTE** that the paired fins are used for steering as well as communication. They adjust movement laterally and vertically, making the fish maneuverable. Pectoral fins are the shoulder fins or Aarms@ of the fish, while the pelvic fins are the hip fins or Alegs.@ Pelvic fins may be positioned at the throat, thorax or toward the back of the belly.

##### 3. Other external organs

- a. Mouth
  - 1) Food gathering
  - 2) Type, location and size aid identification
- b. Barbels
  - 1) Sensory organs
  - 2) Present in some families
- c. Operculum
  - 1) Opening behind gills
  - 2) Protect gills from damage
- d. Eyes
  - 1) Visual organs
  - 2) Location indicates feeding strategy
- e. Nares
  - 1) Chemical receptors
  - 2) ANose@ holes
- f. Lateral line organ
  - 1) Chemical and vibration receptors
  - 2) Line of sensory pores

Briefly **REVIEW** other external organs that can be observed in the fish prints or on the specimens used. **NOTE** that the location, size and type of mouth helps in identification and determining the feeding strategy of the fishes.

**NOTE** that barbels are located in some families of fishes and that they serve as chemical receptors to aid in locating food.

**POINT OUT** the operculum and note that it covers and protects the gills.

**NOTE** that the fish=s eye is similar in function to our own. **STRESS** that their location and size give clues to habitat and feeding strategies.

**INDICATE** the external nares and their chemical reception function.

**ASK** how a fish Ahears@ or picks up vibrations in the water. **NOTE** that the lateral line organ acts as both a chemoreceptor and a vibration receptor. **ASK** how this sense might be useful under dark or murky conditions.

#### IV. Finishing the banner or shirt

- A. Finishing the banner
  - 1. Turn banner face down
    - a. Fold along top edge
      - 1) Width adequate for suspending rod
      - 2) Stick along edge with rubber cement
    - b. Fold along bottom edge as above
  - 2. Insert dowel or bamboo rod
  - 3. Attach cord or yard to hang banner
- B. Finishing the shirt
  - 1. Iron in paint before wearing

### Lesson Narrative

#### Fish Print History

After a good day of fishing, anglers like to revisit the day=s events and discuss their catches and losses. Although much of the fun in this story telling results from embellishment in the re-telling, recording the catch can also be fun. One of the ways of recording a good day=s catch can be to create a fish print of their own as a reminder, a learning aid, or even a trophy.

Fish printing dates back to Japan over 100 years ago. Anglers made fish prints to record their catches and to save information on fish biology. The Japanese term for fish printing is Agyotaku@ (pronounced ghio-ta-koo), and it is an art form that can be useful in other ways as well. Although this method of printing does not provide the best avenue for fish identification, it can be very useful for learning external anatomy as well as recording a catch effectively.

The traditional Japanese method of fish printing used rice paper as a medium for the print, but prints can be made on other types of paper or cloth, including tee-shirts. Block printing paper makes excellent prints, but drawing paper, white paper, tissue paper or even plain newsprint can be used. Shiny, slick finished paper does not hold the paint or ink well, however.

#### Material Tips

The best location to purchase the necessary supplies for this activity is your local arts and crafts store. Most of these stores will carry the paint, paper, glue, etc. T-shirts can either be purchased or have the

participants bring one from home. The T-shirts should either be white or light colored.

Although nearly any fish can be used, fish selection is important to the success of the activity. Fish with laterally compressed bodies are easier to handle, and those with relatively coarse scales and minimum amounts of slime are easier to print. Flounder, bluegill, perch, rock bass, crappie or similar shaped fishes are easiest for beginners to use. As they develop some skill in fish printing, they can use larger specimens and species with more rounded body shapes. Fish that are too large are difficult for youngsters to handle effectively, while those that are too small may lose some detail in the printing process.

Since the fish must be still, clean and dry to produce effective fish prints, the specimens must be dead before they are used. The potential benefits of having the dead specimen must be weighed against returning the fish to the water, just as the benefits of keeping a fish must be weighed against catch and release. Once the decision to keep the fish has been made, the animals should be killed humanely with minimum damage to their external characters. Freezing is an effective method of killing the fish without damaging them, although larger specimens may be killed with a sharp blow to the head. As in other uses of fish, avoid keeping the fish in conditions where they can begin to decompose if they are to be used in fish printing. Before the fish can be used for making prints, it must be free from slime, clean and dry. Some fishes will require treatment with a mild vinegar solution and being wiped down several times before they are ready to use in printing. Often the quality of the prints will improve with use as the slime layer is depleted.

Paint or inks should be applied sparingly, covering the body before applying material to the fins. The tendency is to put too much paint or ink on the fish rather than not enough. Paint the fins last, just before making the print. Leave the eye blank and paint it in by hand after making the print. This permits some artistic license and may allow an artist to make the eye look more lively by using some white space in the painting.

### **Color Selection**

Although black ink on pale rice paper is the tradition, color adds to the attractiveness of the fish print and allows some artistic expression on the part of the printer. Allow group members to be creative in their painting schemes. The print need not represent the color pattern of the live fish, and the addition of color personalizes the print made by each youngster. That aids in identification of their own work and enhances interest. Remember that light coatings are MUCH better than heavy ones when print quality is concerned. A thick layer of paint will result in a poor replication of the fish.

### **Labeling**

The use of this lesson should determine the type of labeling that takes place. If the specimen fish is a trophy that is being saved as a fish print before going into the family larder, labeling with the location, date, species, size and angler may be all that is needed. If it is to be a learning aid, labeling the external anatomy can prove very useful. In the latter case, forming small groups and providing some suggested labels can be very instructive. Providing quality leadership while they determine the locations of the various parts and how to label them is key to getting the information correct and neatly represented. Once the groups have come to independent conclusions on matching the labels to the fish anatomy on the prints, go over the parts and their functions with them. If possible, take the time to use a discovery approach in outlining the functions of the external features.

### **Use and Display**

Once the paintings, banners or tee-shirts are completed, take the time to make them ready for use or display. Note that the tee-shirts should be ironed with a damp towel over the paint before wearing them or placing them in the laundry. Banners can be hung for display or matted and framed for the use of the maker.

### **Exhibit and Sharing Suggestions**

1. Develop a group or individual display of fish prints representing local species for your county or state fair.

2. Develop a group demonstration for a fair or similar event, assisting others in learning to make fish prints or prints of other things - like flowers, leaves, or animal tracks.
3. Set up a display highlighting the external anatomy of different species of fish and how they differ.
4. Create a set of teaching posters to assist other young people in learning the external anatomy of local fishes. Make your teaching materials available to your leaders or volunteer to instruct other young people in external anatomy and identification.

#### **Community Service**

1. Volunteer to make fish prints with participants at a local fishing derby or national hunting and fishing day celebration.
2. Use the fish printing approach to teach fish anatomy with young children in a community setting.

#### **Links to Other Programs**

Links to other elements of the Sportfishing Program can be made easily, particularly with fish biology and ecology and with the angling skills areas. This lesson also can be used to develop artwork that can be shared in communications and artistic expression projects. The content can be used in other areas of conservation education, and the program fits well with elements of Project WET and Aquatic WILD, particularly with *Water Messages in Stone* (Project WET), *Water Plant Art*, *Micro Odyssey*, and *Fashion a Fish* (Aquatic WILD).