TEACHING KATE
TEACHING KIDS ABOUT THE ENVIRONMENT

WHO'S SWIMMING IN MY WATER

Grade Level: 3 **Time Required: varies with student ability**

SC Science Standards

This lesson plan was correlated with only the grade level specified unless otherwise noted.

I. A. 2. a
I. A. 4. a
II. A. 1. b
II. A. 2. a
II. C. 1. a
II. C. 2. a, d

Purpose

Students will learn how to use a dichotomous key to classify five given fish from the South Carolina Freshwater Fishes Poster. The students must first learn the parts of a fish and where the part is located on the fish's body. The student will go to the library and research the given material. Finally, the student will locate the fish in the lakes of South Carolina and learn the importance of having the correct environment and resources to sustain life.

Skills

Classification, descriptive writing, following directions, interpretation, observation, research and synthesizing.

Concepts

Relationships between the parts of a fish and where and how they live, classification, morphology, taxonomy, awareness of populations and their ecosystems; understanding why different species need different habitats.

Materials Needed

six foot paper model of a "typical fish"
poster of the "typical fish"
booklet: "South Carolina Freshwater Fishes"
envelopes with fins of the fish drawn
diagram of a fish without fins
index cards with the parts of a fish
copy of one of the Dichotomous Keys
index cards with the pictures of SC Freshwater Fish
paper and pencils

Definition of Terms

Adipose Fin	An additional dorsal fin in certain fishes consisting mostly of fatty tissue and usually without supporting rays.
Anal Fin	An unpaired fin in fishes, located on the ventral median line between the tail and the anus.
Anterior	Located on or near the front of the body.
Barbels	One of the slender, whiskerlike sensory organs on the head of certain fishes.
Caudal Fin	The tail fin of a fish.
Depression	A noticeable division of the soft and spiny dorsal fins.
Dichotomous Key	Identification key based on a series of choices between alternative characteristics.
Dorsal	Of, toward, on, in or near the back.
Dorsal Fins	The main fin on the dorsal surface of fishes and certain marine mammals.
Fins	A membranous appendage extending from the body of a fish, or other aquatic animal, used for locomotion, steering or maintaining balance.
Horizontal Bars	Dark lines on the fish's body from anterior to posterior.

Hybrid	The offspring of genetically dissimilar parents or stock; especially, the offspring produced by breeding plants or animals of different varieties, species or races.
Impoundments	A reservoir where water is accumulated.
Lateral Line	A linear series of sensory pores and tubes extending along the side of a fish or certain other aquatic animals.
Notch	A separation between the dorsal fins.
Operculum	A lid or flap covering the gills of some fish.
Pectoral Fins	Either of the anterior pair of fins attached to the pectoral girdle of fishes.
Pectoral Girdle	A skeletal structure in vertebrates, attached to the pelvic girdle.
Pelvic Fins	Either of a pair of lateral fins of fishes, attached to the pelvic girdle.
Pelvic Girdle	The skeletal structure of bone or cartilage by which the hind limbs or analogous parts are supported and joined to the vertebral column.
Posterior	Pertaining to the caudal end of the body in an animal.
Scales	A small, plate like dermal or epidermal structure characteristically forming the external covering of fishes, reptiles and certain mammals.
Soft-finned	Having fins supported by flexible cartilaginous rays.
Spiny-finned	Having fins supported by sharp, spiny, inflexible rays.
Streamers	Extensions of the dorsal or anal fins in some fish.
Ventral	Pertaining to or situated on or close to the belly; abdominal.
Vertical Bars	Dark lines on the fish's body from dorsal to ventral.

Before the Session

The teacher will need to draw a six foot model of the "typical fish" found in the lesson (copied from the booklet South Carolina Freshwater Fishes) and draw a poster of the same fish. The

teacher should also have the booklet South Carolina Freshwater Fishes containing a copy of the dichotomous keys from Dr. Edward P. Donovan, Professor of Science Education at the University Of South Carolina at Spartanburg, a set of index cards with all of the parts of the fish labeled, paper and pencils.

The Guide to South Carolina Freshwater Fishes Poster (booklet) and the poster of SC Freshwater Fishes from the South Carolina Department of Natural Resources is also needed. The teacher will make a worksheet with a fish that has no fins and draw pictures of the different types of fins that are found on the fish. Each envelope will have several types of each fin in it.

Background Information

A fish has five or six fins on its body used for balance, steering in the water and moving from place to place. The types of fins and location on the body are given in the definitions. Fish in lakes, rivers, streams, etc. have roles as predator, prey, consumer of vegetation (to help in its control), a means of recreation for mankind, a source of food and many other functions.

The channel catfish prefer rivers and large creeks with slow to moderate flow, as well as, large impoundments. It is found statewide and has been stocked in many rivers, streams and farm ponds. It feeds on nearly all aquatic forms such as crayfish, insects, amphipods and other fish. It does not have scales. It has separate dorsal, caudal and anal fins. It has barbels and an adipose fin. Its head tapers. The channel catfish has a wide anal fin and spots on its body.

The longnose gar prefers sluggish rivers and impoundments. It is found in all coastal streams, piedmont rivers and reservoirs. It feeds on fish and other living or dead animal matter. The longnose gar has a body more or less covered with scales. Its single, soft dorsal fin begins very far back on the body of the fish. The pectoral fin is ventral, the caudal fin is rounded and the anal and dorsal fins are directly opposite. It has a long snout and spots on its body.

The redbreast sunfish prefer the blackwater streams of South Carolina's sandhill region and coastal plains. They prefer deeper waters especially those with rock and gravel bottoms, logs, aquatic vegetation or other submergent cover. They are found statewide, even in the smallest foothill streams; however, they are most productive and demonstrate significant growth below the fall line. The redbreast feeds predominately on aquatic insects, terrestrial insects, other invertebrates and occasionally fish. Its body, which is less than three times as long as it is wide, is more or less covered with scales. Its two dorsal fins are joined and long. The anterior and posterior dorsal fins have a depression between them; these are directed toward the body. The caudal fin is slightly pointed. There is a hump above the eye. The operculum is dark. The pectoral fin is rounded and it has vertical bars on the body.

The bluegills prefer small and large impoundments as well as sluggish rivers and streams. They are located statewide, including large and small impoundments and all rivers. They feed on a variety of mature and immature insects as well as other small invertebrates. Most of their feeding activity occurs near the surface. The bluegill's body, which is less than three times as long as it is wide, is covered with scales. Its two dorsal fins are joined and long. The anterior and posterior dorsal fins have a depression between them and are directed toward the body. The caudal fin is slightly pointed. There is a hump above the eye. The spots on the body form a netted pattern.

Striped bass prefer the major rivers and large impoundments of South Carolina. They are also found in estuarine and coastal areas. They are found in all of South Carolina's coastal rivers with largest populations occurring in the Savannah, Cooper and Santee rivers. Excellent reservoir fisheries exist in Lakes Marion, Moultrie, Murray and Wateree. Smaller populations are found in Lakes Hartwell, Thurmond, Secession and Greenwood. They feed mostly on fish, preferably threadfin shad, gizzard shad and blueback herring. The bodies of striped bass are covered with scales; their two dorsal fins are separated. Horizontal markings go the length of the body and the caudal fin has a deep notch.

Rainbow trout prefer clear, cool (not in excess of sixty-eight degrees Fahrenheit) water of the highest quality. This habitat can exist in selected tailraces of large impoundments or occasionally in the deeper waters of certain reservoirs. In their normal stream habitat, rainbow trout will locate in the faster moving waters such as at the head of a pool area. They are found in the mountain streams of Oconee, Pickens and Greenville counties. Rainbow trout are also present in Lake Jocassee and the tailraces of Lakes Murray and Hartwell. They feed primarily on insects, crawfish and other fish. The scales of the rainbow trout are too small to be seen on the elongated body. The caudal, dorsal and anal fins are separate; an adipose fin is present. There is a clear horizontal band across the side. Rainbow trout haves spotted caudal, dorsal and adipose fins.

To use the dichotomous key the student should read both statements. After reading both statements, he/she should choose the one that is correct about his/her fish. At the end of the correct statement there will be a number of the next pair of statements to try. Continue to follow the key until the name of your fish is at the end of the statement.

Suggested Lesson Plan

Lesson 1 - 1-2 weeks

1. The teacher and students will brainstorm on why we have fish in lakes, rivers, streams, ponds, oceans, etc.

2. The teacher and students will group like fish and see if everyone agrees. With this activity, the students will discover why fish need to be grouped or classified in a special way.

3. The teacher will sit with the students in a circle and begin to teach the parts of a fish.

4. The students will choose an index card and go to the six foot model in the center of the circle and stand where the part would go. This game would be played until all of the students had several chances to participate. The game would also be played for several days.

5. The students will make FISHO cards. The cards are like bingo cards except instead of numbers the boxes have the parts of a fish in them. The teacher will point to the poster of the fish and the students will cover the correct body part. The teacher could also call out the definition of a term to be covered on the card.

Lesson 2 - 2-3 days

1. The teacher will use the dichotomous key along with the students to identify several fish.

2. The teacher will divide the class into cooperative groups of three or four and choose four fish for them to classify or identify.

3. Students will use the dichotomous key and identify five fish that the teacher assigns.

Lesson 3 - 2-3 days

1. The students will go to the library and find out the kind of water and food that a fish assigned to him/her needs to survive.

2. The students and teacher will research to see what kind of waters are in the major lakes and rivers of South Carolina. They will also check on the availability of food in the various bodies of water. They will then predict what fish live in the different lakes.

3. The students will write a paper to describe what they think the ecosystem in South Carolina would be like if the various lakes and their inhabitants were drastically changed. Would it have an effect on the way we live?

Application

The students will begin to develop an understanding of how scientists use classification systems for identifying plants and animals. The students will gain an understanding of how to use a dichotomous key to discover the identity of a given fish.

Students who fish alot will probably be able to recognize a number of the fish already but those who do not go fishing often probably will not be able to do so. Even a person who does fish a lot will probably catch a fish they can not identify every once in a while. A dichotomous key will be helpful because it will allow the person fishing to identify what they caught. Knowing what they caught will add credence to their fish stories and also, garner respect from fellow fisherpersons.

Extension

The students will be able to take the envelopes and the worksheet of the fish without fins and create their own fish. Then following the dichotomous key they will discover if they created a real fish or if they've created some kind of hybrid.

1. The teacher will hand each student the worksheet with the finless fish.

2. Each cooperative learning group of four will get an envelope of fins.

3. Each student in the group will create his/her own fish.

4. Using the dichotomous key that they used earlier, the group will try to identify the fish made by everyone in the group. The objective of this is to see if the student has created a fish that is already in existence in our state or if they might have created a hybrid.

The students will use the knowledge of how to use a dichotomous key in the identification of fish to use the dichotomous key in Familiar Trees in South Carolina for leaf identification.

Resources Available

What is a Fish? 1959. Gene Darby. Benefic Press.

What is a Fish? 1982. David Eastman. Troll Associates.

Where's the Fish? 1986. Taro Gomi. Morrow.

Familiar Trees of South Carolina, A Manual for Tree Study. Kessler and Schoenike. S. C. Forestry Commission in cooperation with Clemson Univ. Cooperative Extension Service, Clemson, S. C. 29634-0310.

Booklets:

Guide to South Carolina Freshwater Fishes Poster. South Carolina Department of Natural Resources, P.O. Box 167, Columbia, SC 29202.

South Carolina Freshwater Fishes. South Carolina Department of Natural Resources, P.O. Box 167, Columbia, SC 29202.

Poster:

South Carolina Freshwater Fishes. South Carolina Department of Natural Resources, P.O. Box 167, Columbia, SC 29202.

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F I S H O

F	I	S	H	O
		FREE SPACE		

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DIAGRAM OF TYPICAL FISH

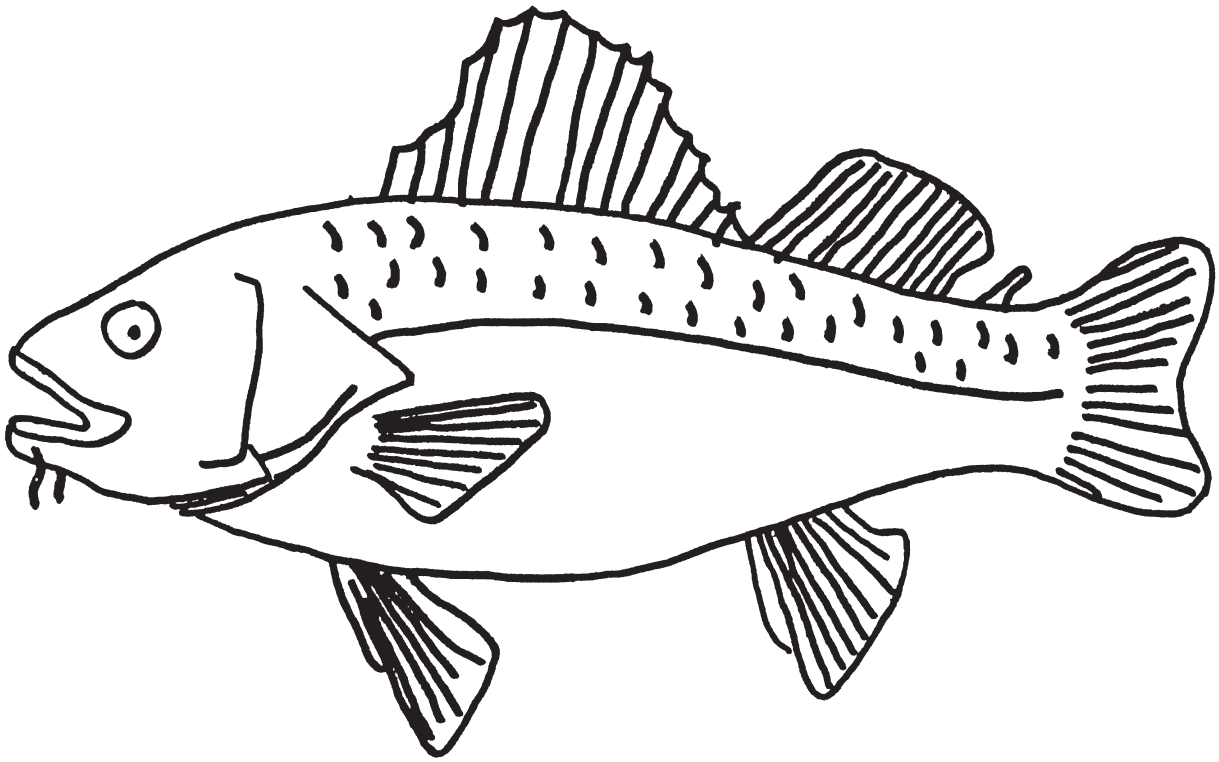

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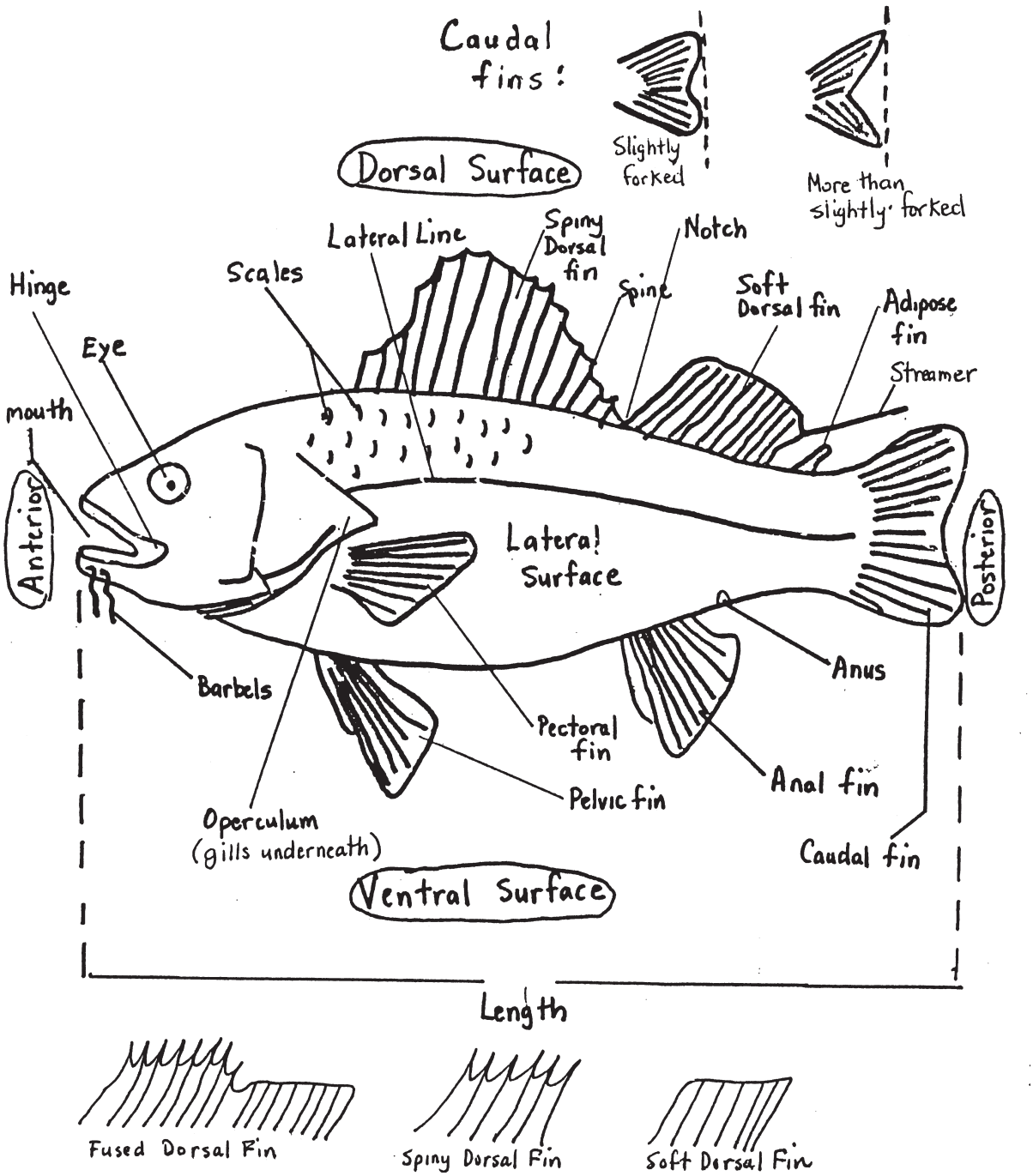
DIAGRAM OF TYPICAL FISH WITH LABELS



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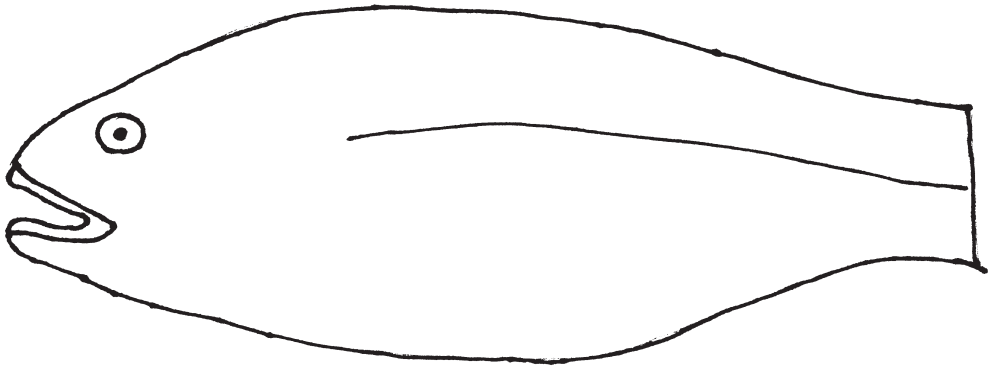
BUILD - A - FISH



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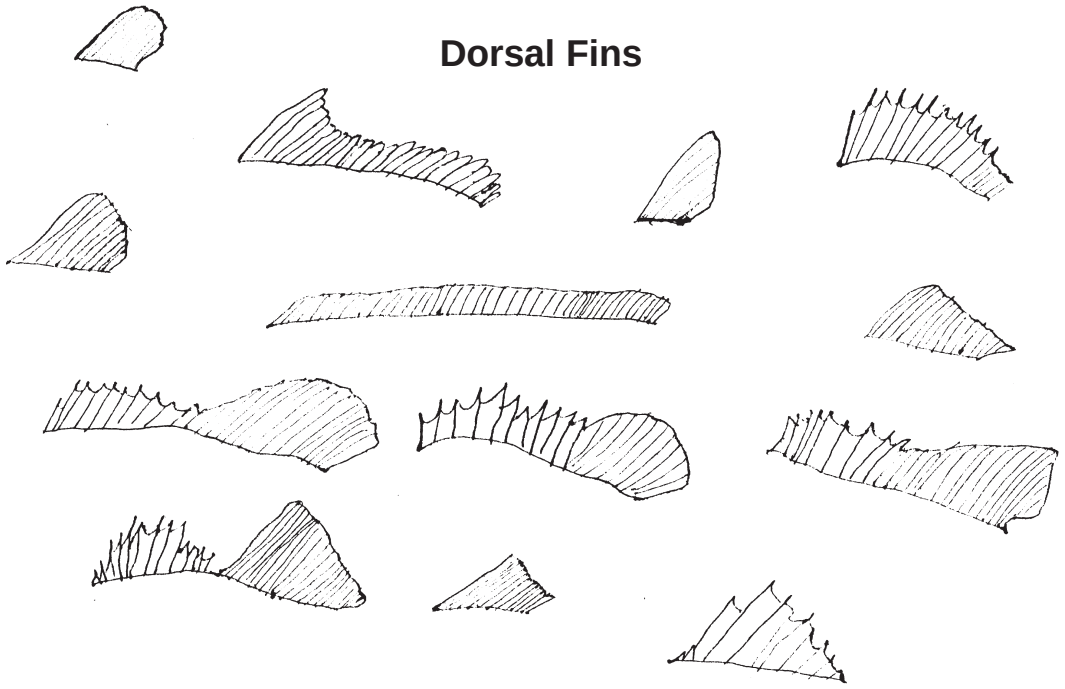
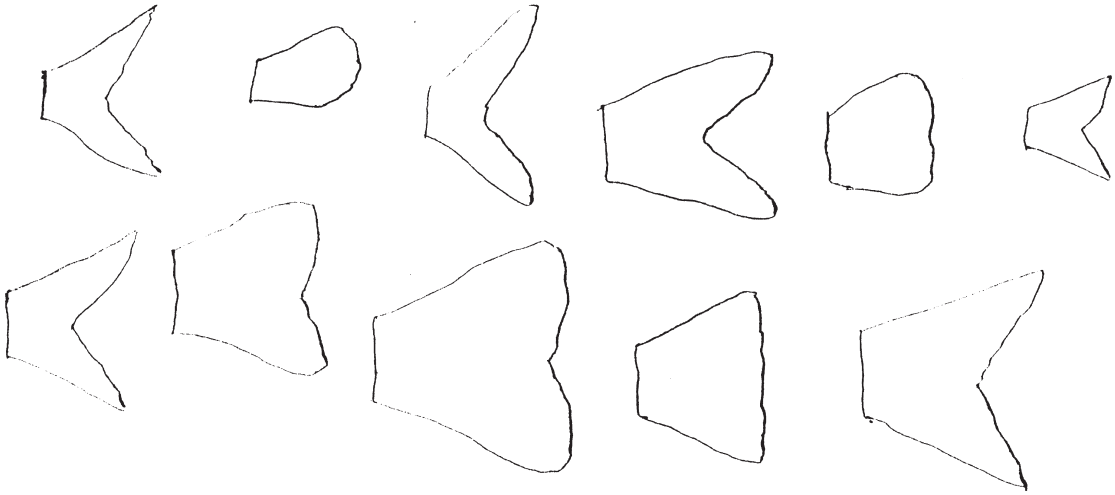
DORSAL AND CAUDAL FINS

Dorsal Fins



Caudal Fins



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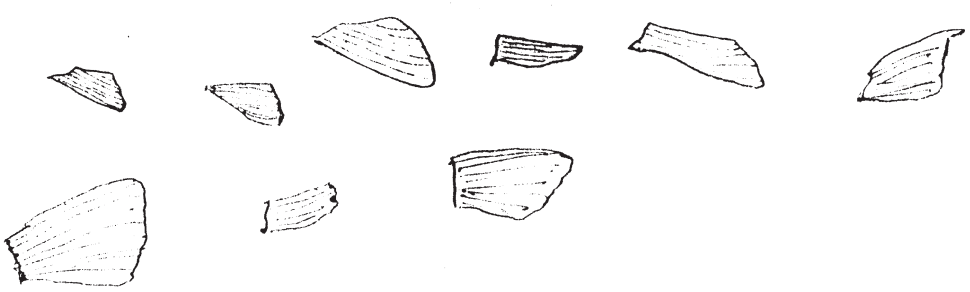
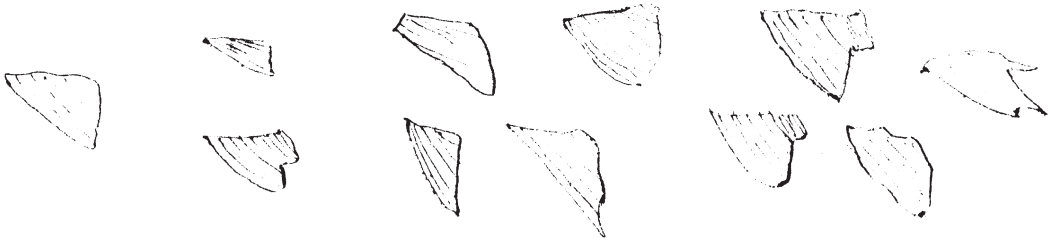
PECTORAL, PELVIC AND ANAL FINS

Pectoral Fins



Pelvic Fins



Anal Fins