ake Erie... Build a Fish — to scale!
This Lake Erie unit has been developed especially for teachers and children in the Elementary grades.

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UNIT 2
BUILD A FISH TO SCALE

OBJECTIVES: The children will be able to

1. Name the different parts of a fish.
2. Assemble a fish using overlapping overheads to reinforce fish parts.
3. Build a fish to scale using jumbo fish puzzle parts.
4. Classify fish according to various fish characteristics.
5. Name ways animals protect themselves.
6. Be familiar with vocabulary words associated with fish.
7. Name different types of fish.

I. Parts of a fish
   A. Fins - Dorsal, Pectoral, Pelvic, Anal, Adipose
   B. Tail (Caudal fin) - round, forked
   C. Mouth - sucker, barbels, top, bottom
   D. Body Shapes - wide, narrow, slender, fat
   E. Spines - present, absent
   F. Markings - spots, stripes
   G. Lateral Lines

II. Activities and Idea Guides
   1. Japanese fish prints
   2. Paper mache fish
   3. Stuffed fish
   4. Take apart fish ditto
   5. Connect dot-to-dot by 2's or 5's
   6. Cut and paste fins
   7. Bingo with fish pictures
   8. Create new creative fish
   9. Follow directions about fins ditto
   10. Addition facts hidden fish
   11. ABC order
   12. Classify by all 7 parts - tails, fins, mouths body shapes, and markings
       a. Use pictures
       b. Use real stuffed fish
       c. Use fish prints
       d. Use overheads of fish
       e. Create charts
       f. Create bulletin board with fish classified and labeled

III. Overlapping overhead fish parts
    A. Idea Guide
    B. Possibility for fish parts worksheets

III. Jumbo fish puzzle parts with Idea Guide
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TEACHER INFORMATION ON PARTS OF A FISH

1. TEETH
Not all fish have teeth. Some fish swallow their food whole. Those that do have teeth exhibit a wide variety...some with big sharp teeth to catch and hold prey, others with bristly teeth to scrape off algae, or flat and heavy teeth for crushing hard-shelled animals.

2. MOUTHS
There are big mouths, tubular mouths, flexible mouths, mouths that point up and mouths that point down...all with special functions for that fish, depending on its environment, the food it eats, and how it protects itself.

3. NOSTRILS
Yes, fish do have noses. They are used to smell chemicals in the water, not for breathing. Some fish have one nostril (a blind sac) on each side of their face. Others have two nostrils on each side, forming a tub through which the water circulates. Some fish are able to smell things located miles away.

4. EYES
Size and color vary from fish to fish. Most fish lack eyelids since their eyes are constantly bathed in water. (Some sharks are the exception.) Fish lack sharp vision...they're nearsighted, and some cave fish lack eyes completely.

5. GILL COVER or OPERCULUM
This flap covers and protects the delicate red gills found underneath. Fish get their oxygen from air dissolved in the water. This can be compared with mammals such as seals and dolphins which must surface periodically to breathe.

6 & 7. DORSAL FIN(S)
Some fish have one, some have two, some have none at all. There is a great variety in fins and their uses in fish. Mammals that live in the water do not have fins, but have modified legs referred to as flukes or flippers.

8. CAUDAL FIN
This is the fish's tail. Some fish move their bodies by thrusting the tail back and forth. For other fish, the tail serves as a rudder or a stabilizer, with propulsion coming from body movements or other fin movements.

9. CAVAL FIN
This fin is sometimes armed with sharp projections. When these supporting rods in the fins are soft, they are called rays. When they are hard and stiff, they are called spines.

10. PELVIC FINS
These fins are analogous to our legs. They are primarily used for fine adjustment of the fish's movements but may be modified for special functions, such as crawling along the bottom, holding or grasping.

11. REXTORAL FINS
These are analogous to our arms and are also used for fine movements. They may be modified for special functions, or in some fishes, absent.

12. SCALES
Although most fish have scales, certain kinds either lack them or have such small scales that they are not noticeable, such as with the catfishes and moray eels. Scales are modified skin cells and help protect the fish from abrasion and skin diseases.

13. LATERAL LINE
The water fishes live in is sometimes turbid, usually in motion and often dark. Therefore, some fish don't depend on sight. Instead, they use a special sense organ, the lateral line. This is a series of pits in the skin that looks like a dotted line. The nerve cells in these pits are sensitive to changes in pressure and tell the fish how deep it is and what sounds are present. It's also sensitive to chemicals dissolved in the water. Sometimes it's even sensitive to electrical fields, and works as a sort of radar.

* From Marine Science Center; Poulsbo, Washington; James A. Kolt, author/editor.
This page has been designed to assist in the assembly of the take-apart bluegill build-a-fish puzzle.
Fish Characteristics

Where the fins are:

1st dorsal
2nd dorsal

lateral line

pectoral fin
pelvic fin
anal fin
tail

Fin types:

adipose
dorsals separate
round tail
dorsals joined
forked tail

Head features:

sucker mouth
barbels
spine
top mouth
bottom

Also look for differences in:

Body shapes (wide, narrow; slender, fat)
Lateral line (present or absent)
Spines (present or absent; location)
Spots or stripes
Head shapes
Fin shapes
Label fish parts. Could be used as a transparency or ditto.
Cut out fish. Classify fish according to the tails, fins, body shape, mouth, markings, and spines. Paste on next page in correct classification.
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**Classify: Lake Erie Fish**
FINS

Label the fins on the fish below. Use the boxes at the bottom of the page.

| ADIPOSE FIN | ANAL FIN | DORSAL FIN |
| CAUDAL FIN | PELVIC FIN | PECTORAL FIN |
| MOUTH | LATERAL LINE | GILL COVER |

TEACHER BACKGROUND - Fins

This exercise is designed to reinforce some of the vocabulary introduced in the section.

You may choose to have your students write the name of the fin in the box or to cut and paste. Each approach has its merits.

Duplicate the activity. One copy per student is recommended. Students may work independently or in small groups at your discretion.

 Reserve a few minutes to discuss the basic concepts covered and to provide the correct answers. Use this opportunity to relate the function of the fin to its structure and location.

From Marine Science Center; Poulsbo, Washington; James A. Kolb, Author/editor
Protect me!
Name one way these animals protect themselves from harm.

- Crab
- Fish
- Starfish
- Shell
IDEA GUIDE FOR TEACHERS:
FISH PARTS CARD GAMES

The following seven pages of fish pictures are to be mounted on cardboard and cut out so you have twenty-eight fish cards. Then you are ready to have fun playing several games to reinforce fish parts.

1. FISH DOMINOS
   Each of four players gets six cards which have been shuffled. One card is placed in the center. Players can match on any of the four sides - mouths, fins, tails, gill covers, spines, etc. Winner is the person who gets rid of all his/her cards.

2. CONCENTRATION
   Place face down, fourteen cards (less, if desired) on left and fourteen on right. Player turns card over on left and turns one over on right. If he/she can tell one fish part they have in common and point out on each card, he/she keeps the pair. If incorrect, turn cards back over. Player with most pairs wins.

3. FISH
   Two to six players. Deal four cards down to all players. Spread remaining cards face down in the center of the room to make up the pond. Each player arranges his/her cards, placing all matching fish part cards in a pile face up in front of him/her. The dealer asks a player for a specific fish part card. If that player has it, he/she must give it up. If not, dealer draws one from pond. If player uses up all cards, chooses from pond. Player with most matches wins.

4. OLD FISH (MAID)
   Two to six players. Select one fish part to be the "Old Fish" or one card to be the "Old Fish." Show card or tell all players the "Old Fish." Mix up all the cards and deal them, one at a time, face down to all players. Each player looks at his/her cards, matches as many matching fish parts as possible in front of him/her. Then players go to left and draw one card from that person's hand. The game continues until all pairs of cards are matched and one player has the "Old Fish." He/she is the loser.

5. WAR
   Make word cards that tell fish parts or characteristics. Two players. Shuffle cards and give half to each player face down. At the count of three, each turns up the top card in his/her pile. If a word and picture card are turned up - the word card wins but only if the player can read the word. If two word (or two picture) cards are turned up, there is "War." Each player adds a card and each player turns a card. The word card gets all six cards. Play continues till one player has all the cards or the most.

6. MOBILES
   Create fish characteristics mobile.
They live on the bottom, feeding on small fish, scallops have large eyes of amber color, and their bodies are elongated and conical. The mantis shrimp is a member of the Stomatopoda family - Anomura. It has a STRANGE walk with its mouth open and PADDLE-LIKE appendages. The apron is the area of the shrimp that is often seen in the wild. They are almost transparent. Lorena often see them all around the area and are evident feeders. The mantis shrimp - Anomura have sharp, scissor-like teeth. All kinds of fish, living and dead, The gata capture them with the monter. The gata feed on not easily captured. Car-rodads are held to the gata are secreted fish, strung and placed.
province other water over sand and gravel pockets. To shoal near at the surface. The white bass
rarely become masses in large schools. They often
attain the white bass and the white perch
Temperate Basses = Perchfishes

White Bass

exploitation. Fish and frogs, they are protected from commercial
sport fishermen. Largemouth bass and bluegill are important
species in this family, much as largemouth bass, sunfish, perch families, and trout

Buntch Family = Centracanthidae

Sunfish

Waters and make a good bet. It will get a wide variety of foods. It is very
The mudminnow is an omnivore. The fish
Mudminnow Family = Umbelidae

Minnow

In sport fishing, and the alewife, both of which are important
This group includes the yellow perch
Perch Family = Percidae

Yellow Perch
cod family is the producer.

The cod family is the producer.

not commercially

Although not commercially

and have a single prominent barbel on the

cod family - gadidae

butcher

potential sound.

been out of their pockets. I'm sure they can cause a

them. The little wimpy have worm Studies of the

correct type, a very valuable sport and commercially

certainly can be as large as 190 pounds, and do catch

the sole bullheads we have seen. The Sturgeon

in muddy ponds and wetlands can weigh pounds dry.

locate food. Bullheads are more cutthroat. They like to

Celtick family - Tenziarchae

Celtick

include more, they peep and retreat.

thus fish the sheephead. Other common names

of some commercial value. Some fisherman call

extends all the way across the flats. It is to

around it makes. It has a recent. These things

that fish are the name from the Drummer

Drum family - Sciaenidae

Drum
a vegetable.

attach itself to another thread that it will feed on as

Lampropeltis use their mouths and tongue to reach for
dennis. When they become adults, they

into a group of poison and they feed on lizards,

particular members. The young of both sexes

their family has some particular and some non-

Lampropeltis - Parthenogonadism

Lampropeltis

in their mouth. It is a very desirable food fish.

picknig up food, the mouth much above up through

more as well adapted for working over the bottom and

of the mouth. The mouth-like mouth under a long

only points. It is a sometimes feature on the bottom

Situlaen Family - Nepenthidae

Situlaen
extra fatty fish (adipose fin) and smooth
eel mouth, thin and vermiform. It has an
The smelt is about 4-9 inches long. It
Smelt family - Salmonidae

Smelt

need for salt. For game and commercial fish, they are taken widely
The minnows provide a major source of food
Minnow family - Cyprinidae

Minnow

smelt, not a small fish, although smaller. They have a milky to like
valuable sport fish. They are a native to the
Salmon can reach 100 pounds. The salmon is a
the extra fatty fin (adipose). The Chum
Trout and Salmon family - Salmonidae

Salmon
part of the commercial and sport fishery.

65 pounds, 4 feet long. Smaller are a sprat-like
one, which the fishermen call "pono" or "pony," 2 feet long. They
are about 10-15 pounds. They have an extended snout.

There are also other species, like the

butter family - Callionymus

butter

smallest

Among the major species are:

very good to eat. However, unless frozen, and
stored, a slight to mild off-color from time to time can be
considered

butter family - Callionymus

butter

often sold frozen and, a member of the family

sport fish. For example, yellowfins, they are popular
on the market such as the barracuda, or

butter family - Callionymus

butter

Giant shed
Some fish have short gills. They are the most common type. These fish have long, pointed tails. They eat small fish. A long, tubular mouth opens with the operculum. The head is twisted at an angle toward the surface. Some fish are检察机关 for aquatic insects. They eat small fish and aquatic insects.
## Fish Characteristics Bingo

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<td>Pirate Perch</td>
<td>Pike</td>
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<td>Killifish</td>
<td>Gar</td>
<td>Sucker</td>
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*Fish Characteristics Bingo*
Fish Characteristics Bingo

Catfish

Surbot

Drum

Bowfin

White Bass

Carp

Paddlefish

Mudminnow

Mooonwe
IDEA GUIDE FOR TEACHERS:

WAYS TO ADAPT DITTO'S

The following ideas are ways you could change the next six dittos.

1. COUNT BY ONES - FISH
   A. Start with 18.
   B. Count backwards.

2. COUNT BY FIVES - DOT TO DOT
   A. Count by tens, hundreds, or thousands.
   B. Count backwards by twos, beginning with 58.
   C. Skip count by threes starting with 23.

3. ADDITION SUMS OF SIX AND EIGHT
   A. Add a tens digit before each ones digit - with or without grouping.
   B. Add a tens and hundreds digit before each ones digit - with or without grouping.

4. A GOOD SWIMMER "FIN" DITTO
   A. Make the directions more complicated - color each fin a specific color.
   B. Give directions to add a habitat.
   C. Add directions to draw other lake creatures.
   D. Write a creative story.
      1. What will I do today?
      2. How can I get off this hook?
      3. Create a funny fish such as a butterfish and tell about it.
   E. Write directions to add a fishing pole, water, and a hook caught in the fish's mouth.

5. LOTS OF FISH IN THE LAKE DITTO
   A. Label all fins on fish A, B, C, D, and E.
   B. Tell which fins are missing from which fish.
   C. One red fish with eight (parallel) stripes.
      One orange fish with five (equilateral) triangles.
      One blue fish with six (rhombic) rectangles.
      One green fish with fourteen circles - seven small, three medium, four large.
   D. Create the habitat for these fish.
   E. Write creative story - where are the fish going and why.

6. FISH ABC ORDER
   A. Use reverse ABC order.
   B. Using the same beginning consonant think up an adjective or adverb for each word. For example, tooth top mouth, shiny spots, dominant dorsal.
I stay in the ocean. I like to come backled bikes.

From the Wetlands Institute, Cape May Co., New Jersey.
Count by 5s and connect the dots.
Color green the areas where the sum = 6
Color blue the areas where the sum = 8

A good swimmer.

1. Put an X on the caudal fin.
2. Put a □ around the pectoral fin.
3. Put a ○ around the anal fin.
4. Color your fish.

From Marine Science Center; Poulsbo, Washington; James A. Kolb, author/editor.
There are lots of fish in the lake.

1. Color two fish red or orange.
2. Color three fish blue or green.

Put body parts of fish in ABC order.

- Spines
- Spots
- Dorsal
- Pelvic
- Adipose
- Round tail
- Sucker mouth
- Top mouth
- Caudal
- Bottom mouth
- Barbels
- Markings
- Forked tail
- Stripes
- Wide body
- Pectoral
- Narrow body
- Anal
- Lateral lines
1. Lake Erie "Background"
   (Sponge paint or water color, wet-on-wet, wet-on-dry background)
   Then either draw or paste fish (solid or outline form) on "Lake Erie."

2. Stuffed Lake Erie paper fish

3. Tissue paper and starch over small balloons. Tear tissue in strips,
   patches, etc. Adhere to balloon with starch mixture (2 parts starch
   to 1 part water.) Add paper fins, tails, etc.

4. traditional fish

5. Fish mobiles

6. Fish kites

7. Fish mural

8. Fish prints—styrofoam, real fish, sponge, positive/negative

9. Paper craft fish
   Use varied cut paper skills: trimming, curving, scoring, etc.

10. Create a lake scene with crayons then use water based paint to "wash" it

12. Melt crayons between wax paper to create lake Erie fish silhouette. (Outline with marker.)

13. Torn paper fish scene.

14. Plaster of Paris prints in wet sand. (Use real fish.)

15. Sandpaper print scenes, draw on sandpaper with crayon. Press hard for a bright picture. Turn over onto regular white paper. Iron over back side of sandpaper to make print.

16. Finger paint fish—Use various techniques of finger painting to create fish. Then make a print of this!

17. Stickery fish

18. Paper bag or milk carton fish

19. Fish "sock puppets"

20. Fish "paper doll" style

21. Honey comb fish
   Purchase honey comb paper. Students draw only on top half.
   When they correctly open up the honey comb, the entire fish will appear.

22. Fish pennants

23. Potato fish
   Use potato as fish body. Cut out fins, mouth and eyes and attach to fish body with straight pins.
   (Cucumber, sweet potato etc. can be substituted for potato.)
Cut fish apart. Make a puzzle!
GOING FISHING

Now that you know about fish, let's make one! Here are the things you will need.

Materials:
- paper - butcher, or construction
- paper - waste or newspaper
- crayons or paint
- glue
- construction paper - scrap
- stapler
- string
- scissors

Here is how you do it.

Procedure:
1. Fold your piece of paper in half (either lengthwise or widthwise).
2. On one side of the folded paper, make a drawing of your favorite fish.
3. Start at fold and cut out the fish. Cut both sides of the folded paper at once. You will have two fish when you have finished.
4. Color or paint both fish and/or decorate with colored paper. Add fins, tails etc.
5. Staple the two pieces together around edge of fish leaving an opening.

6. Stuff fish with waste paper or newspaper.

5. STAPLE
(LEAVE OPENING)

6. STUFF AT OPENING

7. Staple opening.

8. Hang by string.

9. Enjoy your creation.
When the class has collected some interesting pond life, or when your prize angelfish dies, or when your favorite fisherman catches one THIS BIG, how can you preserve the memory in suitable fashion? You can consign the fish to an ignominious burial in a jar of formalin. You can feed it to the cat or to the family. A taxidermist could mount it on mahogany, or maybe it would make good fertilizer.

For many kinds of fish, the answer lies in a Japanese art form called gyotaku, fish printing. Gyotaku is widely practiced by ichthyologists, who find that this method preserves intact all the intricate details by which fish are identified. This scientific usage developed secondarily to gyotaku as an art, but through it many still discover that the science of life is exceptionally beautiful.

While the making of fish prints is a highly developed art, the basic techniques can be mastered within an hour’s time. For a school, gyotaku can provide a permanent record of fish species studied. Minimal space for display, accurate identification, and complete absence of odor make this method a highly desirable one.

What to use

Materials for the process are easily obtained—India ink, paint brushes (No. 8 or ½-inch size), and a fairly absorbent type of thin paper (paper towels or newsprint). The Japanese use rice paper and Sumi ink, but the expense of these products generally makes them impractical for amateur use.

The fish used for the initial effort should be a somewhat flattened one. Any kind of fish will work, but "thicker" fish are more difficult to print successfully, and even the best prints may appear distorted. An expert will tackle anything from a tuna to an octopus, but beginners would be advised to use flounders, sole, spadefish, and the like.
How to do it

1. Take a preserved or freshly dead fish, rinse it off and blot it dry. (Soap and water may help remove the mucus.) Place it on a sheet of dry newspaper or paper toweling.

2. Record on a sketch where various colors are located on the fish. Color can be added to a finished print in the form of finger paints. (If you want the fins to appear erect on the print you should spread the fins and hold them in position by sticking pins through the fins into a piece of clay on the reverse side.)

3. Brush ink onto the specimen from front to back, including all fins. Use a heavier coating on the edges of the fish and less on the center. Paint around the eye, not over it.

4. Cover the fish with the paper on which a print is to be made. Press evenly with fingers over the entire surface, emphasizing the outline.

5. Peel the print off carefully from head to tail. Add a dot for the eye and apply any needed colors or markings.

The first attempts at gyotaku are likely to yield only blackened fingertips and fish silhouettes. Persevere! Experiment with less ink to give sharper details. The same fish can be inked many times before its scales loosen and stick to your brush.

Students thoroughly enjoy gyotaku as an arts-and-science activity. Some become experts and proceed to print other types of animals with great success.

The next step? Write some haiku to go with your gyotaku!


The author is indebted to Will Hon, Education Director University of Georgia’s Marine Extension Center, Skidaway Island, for introducing her to this technique.
TEACHER BACKGROUND - Fishwich Crossword Puzzle

This activity is designed to reinforce vocabulary words introduced in the worksheets. Many of your students may not be familiar with this type of puzzle. Provide as much help as they need to get them started. The puzzle is not complex. The clue words are listed next to the puzzle.

Duplicate the crossword puzzle. One puzzle per student is recommended. Students may do this activity individually or in small groups. Be certain that your students understand how to do a crossword puzzle. You may choose to have them work individually at first, then meet in small groups for mutual aid on problem words. Choose the method best suited to your class.

Allow a few minutes to discuss the basic concepts covered and to provide the correct answers. Use this time to summarize the ideas presented in the section on fish.

KEY - Crossword Answers

FISHWICH CROSSWORD PUZZLE

Each clue describes a word you learned about fish. Figure out each clue word. Write it in the row of boxes that begins with the same number as the clue. Clue number 1 across is done for you.

CLUES
ACROSS
1. Fins help a fish to __________.
2. If we __________ today, there will be no fish tomorrow.
3. This fin is used for power.
4. These fish lay their eggs on the bottom side of rocks.

DOWN
1. Some fish swim in __________.
5. You can catch fish with a fishing __________.
6. This is a fish's lung.

WORDS
dorsal
caudal
swim
gill
schools
ocean
lungs
sculpins
smelt
overfish
pole
rod

Draw four fish in appropriate sizes.

My Mom is 25 cm long

My Mom is 22 cm long

My Mom is 20 cm long

My Mom is 18 cm long

Example:

Use this page as an example for a larger game board.

Match the smaller fish with the Mom using a piece of string or yarn.
FISH NAMES

Ever wonder how a fish got its name? Was it from how it looks? Where it lives? How it behaves?
Listed below are some common names of Lake Erie fish and ocean animals.

LAKE ERIE FISH

1. Freshwater drum
2. Madtom
3. Catfish
4. Mudminnow
5. Walleye
6. Pirate-parch
7. Sunfish
8. Paddlefish (Endangered species)
9. Mooneye (Endangered species)
10. Bigmouth buffalo
11. Silverside
12. Bullhead
13. Mosquitofish

OCEAN ANIMALS

1. Hammerhead shark
2. Hatchetfish
3. Swordfish
4. Dogfish
5. Starfish
6. Pipefish
7. Jellyfish
8. Parrotfish
9. Queen triggerfish
10. Porcupinefish
11. Sea robin
12. Toadfish
13. Clownfish

DIRECTIONS:

1. Choose a name from either list and draw a picture (funny!!!) which shows what you think that fish would look like based on its name. Include some basic fish characteristics: pair of eyes, tailfins, mouth, and some normal fin arrangements

AND/OR

2. Write a short story (1 or 2 paragraphs) or a poem which tells how you think the fish you chose got its name.

ORACLIS "Getting to Know Your Local Fish" (EP-19)
It got its name by me. One day I got mad and threw my cat in the water. About two weeks later I went fishing; I caught this funny looking fish, it looked like a fish with a cat head on it, so I threw it back in the water. All of a sudden I was saw catching all these fishes. I decided to name it a catfish. Then I decided to change my name to Catfish Hunter.
<table>
<thead>
<tr>
<th>fin</th>
<th>caudal</th>
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<tr>
<td>dorsal</td>
<td>barbels</td>
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<td>pectoral</td>
<td>spines</td>
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<td>pelvic</td>
<td>lateral lines</td>
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<tr>
<td>anal</td>
<td>gills</td>
</tr>
<tr>
<td>adipose</td>
<td>gill cover</td>
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<tr>
<td>stripes</td>
<td>spots</td>
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<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>mouth</td>
<td>markings</td>
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</tbody>
</table>
CHILD'S BOOKLET

Children learn and retain more about any subject when they are actively involved and personalizing the unit. Having your students make their own booklets helps to accomplish this.

On the following page, you will find a cover for a child's booklet. Fasten each student's completed dittos, experiments, artwork, or other unit projects together with a copy of this cover page to make a booklet for each child.

You may want to use the booklets as a student evaluation of each day's work. Have your students draw or write about something they learned during the day, then include these responses in the children's booklets.
Look at Lake Erie

name
Library Books

The following books are likely to be found in your school library:

**Ships - Boats**

Ships of the Great Lakes.................Buehr, Waller
Boat Book...............................Gibbons, Gail

**Ohio**

Ohio's Natural Heritage...............Lafferty, Mike B.

**Rivers**

Rivers and Lakes.......................Updegraff, Imelda and Robert

**Fish**

The Life of the Seashore...............Amos, William Hopkins
The First Book of Fishes...............Bendick, Jeanne
Along the Seashore.....................Buck, Margaret W.
In Ponds and Streams...................Buck, Margaret W.
Fins and Tails..........................Campbell, Elizabeth A.
Tide Pools and Beaches................Clemons, Elizabeth
Fishes.................................Fichter, George S.
Fishes, and How They Live............Fichter, George S.
A Trip to the Pond.....................Hofmann, Melita
The Fishes.............................Lubell, Winifred
In a Running Brook.....................Ommenney, Francis Downes
What is a Fish..........................Darby, Gene
The Sunlit Sea..........................Goldin, Augusta R.
Brian Wildsmith's Fishes..............Wildsmith, Brian
Fish is Fish............................Lionni, Leo
Fishy....................................Lionni, Leo
The Science-Hobby Book of Fishing.....Shoemaker, Hurst
My Learn to Fish Book.................Denham, Ken
Pets From the Pond.....................Buck, Margaret
Fish Do the Strangest Things..........Hornblow, Leonora and Arthur
Fishes.................................Wildsmith, Brian
Some of Us Walk, Some Fly, Some Swim ..Frith, Michael
Adaptations............................Bindick, Jeanne
Fins and Tails: A Story of Strange Fish..Campbell, Elizabeth A.

**Food**

Eating and Cooking Around the World....Berry, Erick
Eating Places............................Zim, Herbert S.
Animals
The True Book of Animals of Small Pond........Erickson, Phoebe
First Book of the Seashore..................Blassingam, Wyatt
Seashore-Seashore Creatures................Jackson, Paul

Water Pollution
Our Dirty Water............................Elliott, Sarah M.
Rivers and Watersheds in
America's Future.........................Helfman, Elizabeth S.
The Wildlife of North America...........Mason, George F.
Junior Science Book of Water...............Peterson, Otis
Clean Air, Sparkling Water; The Fight
Against Pollution.......................Shuttleworth, Dorothy E.
The Life of Rivers and Streams...........Usinger, Robert Leslie
Ecology and Pollution/Water.............Gutnik, Martin J.

Erosion
The Wind Has Scratchy Fingers...........Rosenberg, Ethel C.

Pollution
Dinosaur....................................Hoff, Syd
Change and Time..........................Podendorf, Illa
The Wump World..........................Peet, Bill

Ecology
Ecology – The Circle of Life............Hungerford, Harold
<table>
<thead>
<tr>
<th>Song</th>
<th>Composer</th>
<th>Source</th>
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<tbody>
<tr>
<td>All the Fish Are Swimming in The Water</td>
<td>American Folk</td>
<td>MSGO</td>
</tr>
<tr>
<td>All the Little Birds (Fish)</td>
<td>French Folk</td>
<td>SBM-K</td>
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<td>Alice Alee O, The</td>
<td>American Folk</td>
<td>DMT-EC</td>
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<td>At the Harbor</td>
<td>McLaughlin</td>
<td>S&amp;G</td>
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<td>Bell Buoy</td>
<td>Wood</td>
<td>MSF</td>
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<td>Billowing Sails</td>
<td>Wood</td>
<td>MSF</td>
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<td>Buying Fish</td>
<td>Yiddish Folk</td>
<td>SBM-III</td>
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<td>Canoe Song</td>
<td>American Indian</td>
<td>EM-III</td>
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<td>Cargo Workers</td>
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<td>Italian Folk</td>
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<td>El barco chiquitito (The Little Boat)</td>
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<td>Schubert</td>
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<td>Wood</td>
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<td>D</td>
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<td>Smith</td>
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<td>Haynie</td>
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<td>Wright</td>
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<td>AFSC</td>
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<td>I'd Like To Be a Lighthouse</td>
<td>Frankenpoli</td>
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<td>Imagination of Grand Sea</td>
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<td>Wilkins</td>
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<td>Zaritsy</td>
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<td>My Boat</td>
<td>Hawaiian Folk</td>
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<td>Row, Row, Row Your Boat</td>
<td>Traditional Round</td>
<td>EM-III</td>
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<td>Sailboats</td>
<td>Buttolph</td>
<td>MIM</td>
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<td>Marks</td>
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<td>Ships</td>
<td>Buttolph</td>
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<td>Shore</td>
<td>Miller</td>
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<td>Six Little Ducks</td>
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<td>Stop the Poison</td>
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<td>Ten Little Frogs</td>
<td>Pavelko</td>
<td>SF</td>
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<td>There Was An Old Fish</td>
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<td>Tug Boat</td>
<td>Buttolph</td>
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<td>Voyageur, Le (The Voyager)</td>
<td>Canadian Folk</td>
<td>LM</td>
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<tr>
<td>Water Wheel, The</td>
<td>Japanese Game Song</td>
<td>SBM-II</td>
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</table>

Key to Books

ADLS  All Day Long Songs.  Shawnee Press, Inc.


D  Discovery!  M. Whitmark & Sons.


MM  Music in Motion.  Edna Buttolph.  Willis Music Co.


MYA-III  More for Young Americans - III.  American Book Company.


SCS  Sierra Club Songbook.  World Around Songs.

SSL  Sing a Song.  Roberta McLaughlin & Lucille Wood.  Prentice-Hall, Inc.


SBM-I  Silver Burdett Music - Book I.  Silver Burdett Co.

SBM-II  Silver Burdett Music - Book II.  Silver Burdett Co.

SBM-III  Silver Burdett Music - Book III.  Silver Burdett Co.


'TIM-3  This is Music - 3rd Grade Book.  Allyn & Bacon.

TI  Tickle Tunes - Songs for Little People.  Choristers Guild.
RECORDS FOR RHYTHMIC ACTIVITIES

RECORD
Barcarolle
Boating on the Lake
Boat Rhythms (Creative Rhythms)
  - Rowboat
  - Sailboat
  - Tugs and Liners
Dance-a-Story
  - At the Beach
  - Little Duck
En Bateau (In a Boat)
To a Water Lily

Activities: Sway, rock, swing, push and pull, row, skate, haul anchor.

RECORDS FOR LISTENING

RECORD
Children's Games
  - Leap Frog
La Mer
  - Play of the Waves
"Trout" Quintet
  - Fourth Movement
Water Music
  - Air
  - Hornpipe

COMPOSER
Rubenstein
Kullack
Phoebe James
Barlin
Debussy
MacDowell
Bizet
Debussy
Schubert
Handel

Records available in LRC in most schools
POSTERS FOR YOUR BULLETIN BOARD

The next twelve pages should be removed from the unit and taped or glued together in order in sets of four on poster board. If you laminate the resulting poster, you can have students draw or write on it with watercolor markers.
Carp

Yellow Perch
Coho Salmon

Channel Catfish
Bluegill
Smallmouth Bass
Freshwater Drum
(Sheepshead)
White Bass
White Crappie
Ohio Sea Grant Program

Charles E. Herdendorf, Program Director
Rosanne W. Fortner, Assistant Director for Education
Victor J. Mayer, Project Director