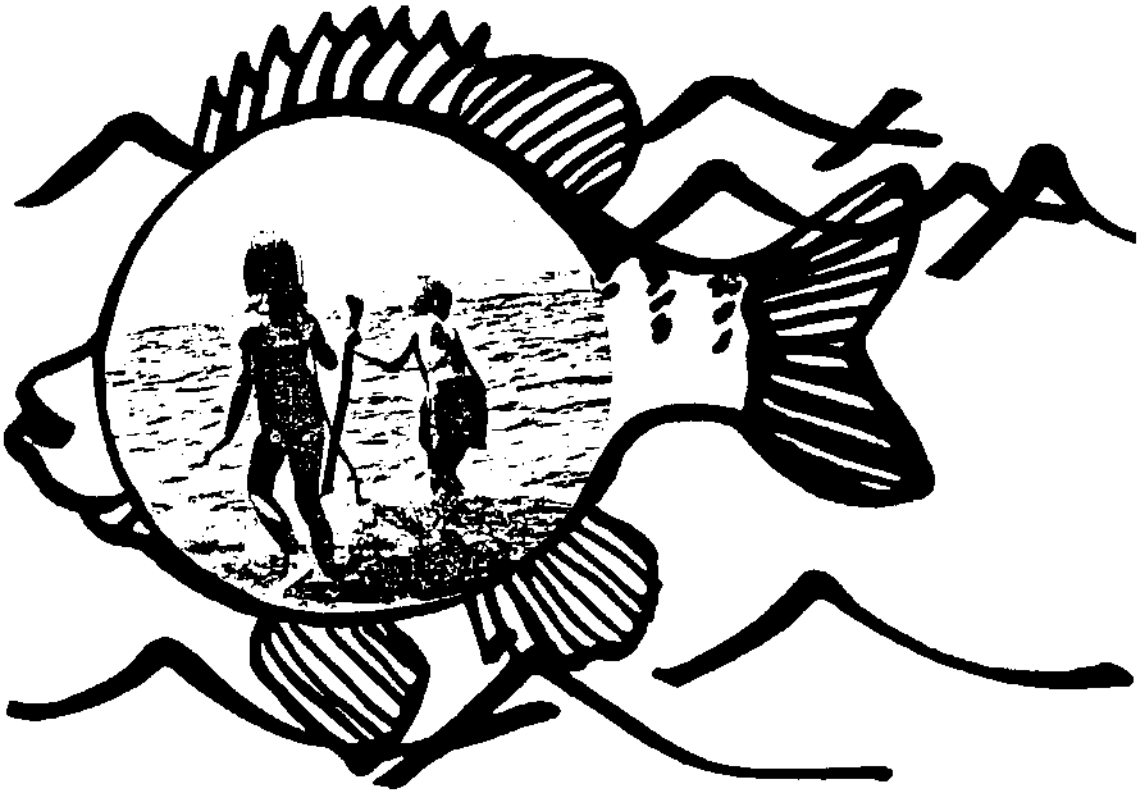
EP-31

ake Erie...

Take a bow

this Lake Erie unit has been developed especially for teachers and children in the Elementary grades



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LAKE ERIE... TAKE A BOW

OBJECTIVES: When they have completed this unit, the children will be able to

1. identify the Great Lakes and pick out Lake Erie on a map,
2. demonstrate knowledge of Lake Erie's origin and geography,
3. list some uses of Lake Erie, and
4. give examples of how Lake Erie affects people's lives and how people affect Lake Erie.

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Streamlined Unit: To teach about Lake Erie in one week

1. Size, shape, location
   - A. Lake Erie Introduction
   - B. Great Lakes Area transparency masters
   - C. Compare the Great Lakes worksheet
2. Important Lake Erie cities
   - A. Idea Guide: Tour of Lake Erie Cities
   - B. Lake Erie Cities transparency master
3. Uses of Lake Erie
   - A. Idea Guide: What's the Use
   - B. Lake Erie Uses transparency master
   - C. Lake Erie Uses word scramble worksheet
4. Lake Erie affects people
   - A. Lake Erie Makes a Difference cut and paste worksheet
   - B. Hometown Survey
5. People affect Lake Erie
   - A. Our Effect on Lake Erie worksheet
   - B. Idea Guide: Lake Erie Word Web

Appendix: Posters for your bulletin board

LAKE ERIE

Lake Erie is the fourth largest of the Great Lakes, but the twelfth largest freshwater lake in the world. Once called a "dying lake", it is making a steady recovery with the help of research, regulations, and care.

Lake Erie Watershed

Extends from the south central portion of the Michigan thumb near Port Huron, Michigan, south to northwestern Ohio and eastern Indiana, east along Lake Erie through Ohio and Pennsylvania to Niagara Falls, then northwest to Sarnia, Ontario. The water provided by Lake Erie for waterborne commerce, navigation, manufacturing, power production, and recreation has led to intensive industrial development along its shores.

Lake Erie Facts

LENGTH: ..... 41 mi (387 km)
BREADTH: ..... 57 mi (27 km)
DEPTH: 62 ft (18 m) average, 210 ft (64 m) maximum
VOLUME: ..... 116 cubic mi (156 cubic km)
WATER SURFACE ..... 9,910 sq mi (25,666 sq km)
TOTAL AREA (land & water): ..... 33,500 sq mi (86,765 sq km)
SHORELINE LENGTH (includes islands): ..... 856 mi (1,377 km)
OUTLET: ..... Niagara River and Falls
DETENTION TIME (shortest of the lakes): .. 2.6 yrs

Geography

SURROUNDING STATES: ..Michigan, Pennsylvania, Indiana, Ohio, New York
COUNTRIES: .....Canada and United States
MAJOR CITIES: .....Detroit, MI; Buffalo, NY; Cleveland, Toledo, OH; Erie, PA
MAJOR PORTS: .....Detroit, MI; Buffalo, NY; Ashtabula, Cleveland, Conneaut, OH; Erie, PA, Lorain, OH, Sandusky, OH
POPULATION: .....11,347,500 (US); 1,515,445 (Canada)
RECREATION: ..... Major recreation areas: Bass Islands, OH; Presque Isle, PA; Niagara Falls, NY. NATIONAL RECREATION AREA: Cuyahoga Valley and Ottawa National Wildlife Refuge, OH; FRESHWATER ESTUARINE SANCTUARY: Old Woman Creek, OH. Many states and provincial parks provide a variety of outdoor recreation opportunities including boating, fishing, swimming, canoeing, hiking.

How Water is Used

AGRICULTURE: ..... 41 million gallons per day (mgd)
POWER PRODUCTION: ..... 9697 mgd
MANUFACTURING: ..... 5783 mgd
DOMESTIC: ..... 1492 mgd
MINING: ..... 198 mgd
COMMERCIAL: ..... 403 mgd
WATERBORNE COMMERCE, FISHERY, RECREATION: ... instream uses of water (does not withdraw or divert water from its natural source)

Land Uses

AGRICULTURE:	62.7%
FOREST:	22.4%
URBAN:	12.3%
OTHER:	2.6%

Shoreline Uses

RESIDENTIAL:	47.0%
COMMERCIAL:	12.0%
AGRICULTURE:	16.0%
RECREATION:	15.0%
OTHER:	10.0%

Economic Importance of Region

MANUFACTURING:	- part of the U.S. "industrial crescent" - produces 66% of U.S. cars - a principal steel producing area - glass manufacturing and ship building
AGRICULTURE:	- economy along western shore is based on agriculture - major products: soybeans, vegetables, fruits, wheat, dairy products
SHIPPING:	- eleven ports serve as major distribution center for iron ore, coal, and manufactured goods
MINING:	- sand and gravel for construction
FISHERY:	- commercial fishery worth $10,554,174 (1977) - second largest Great Lakes sports fishery, over 15 million fish caught in 1977

Resource Problems

Problem	Source	Effects
Phosphorus loadings, nitrogen	Agricultural runoff, combined sewer overflows, inadequate waste water treatment, use of phosphate detergents, industrial discharges	Eutrophication (over-fertilizes water which causes excessive plant growth.)
Toxics	Industrial discharges, leaching from hazardous waste disposal sites and sediments	Fish contamination, human health risks
Organic Pollution, coliform bacteria	Inadequate wastewater treatment	Human health risks, taste and odor problems
Phenols, heavy metals	Industrial discharges (steel and auto principally), atmospheric pollution	Turbidity (decreases recreational and aesthetic enjoyment) fish contamination human health risks

IMPROVEMENTS

- Significant reductions in phosphorus loadings from improved controls
- Mercury levels in fish have declined because of upstream industrial controls

IDEA GUIDE FOR TEACHERS:

NAVIGATING THE GREAT LAKES

Select one or more of the following activities to teach and reinforce the geography of the Great Lakes area. Each of these activities can be adapted for use in any elementary grade.

GREAT LAKES OVERHEADS — You can turn the next four pages into overheads using transparency film and either a copier or a thermofax machine. The Great Lakes overhead fits perfectly over the Great Lakes States overhead to make an overlay. Have students identify the Great Lakes, surrounding states, and principle cities. As an alternative, make dittos of each page and have students work independently.

WHO AM I? — Give clues about lakes or states. Students identify the lake or state, color it in, and label it. Have students do dittos independently, or use the overhead for a group activity.

YES OR NO — Play Twenty Questions. Select a lake or a state but do not reveal its name. Students identify the answer by asking questions which can be answered only with yes or no.

SPIN THE ARROW — Play Spin the Arrow on the overhead. Have a student spin a cardboard arrow. The other students name the lake or state indicated by the arrow. Alternatively, divide the class into two teams. The first team to call out the correct answer scores a point.

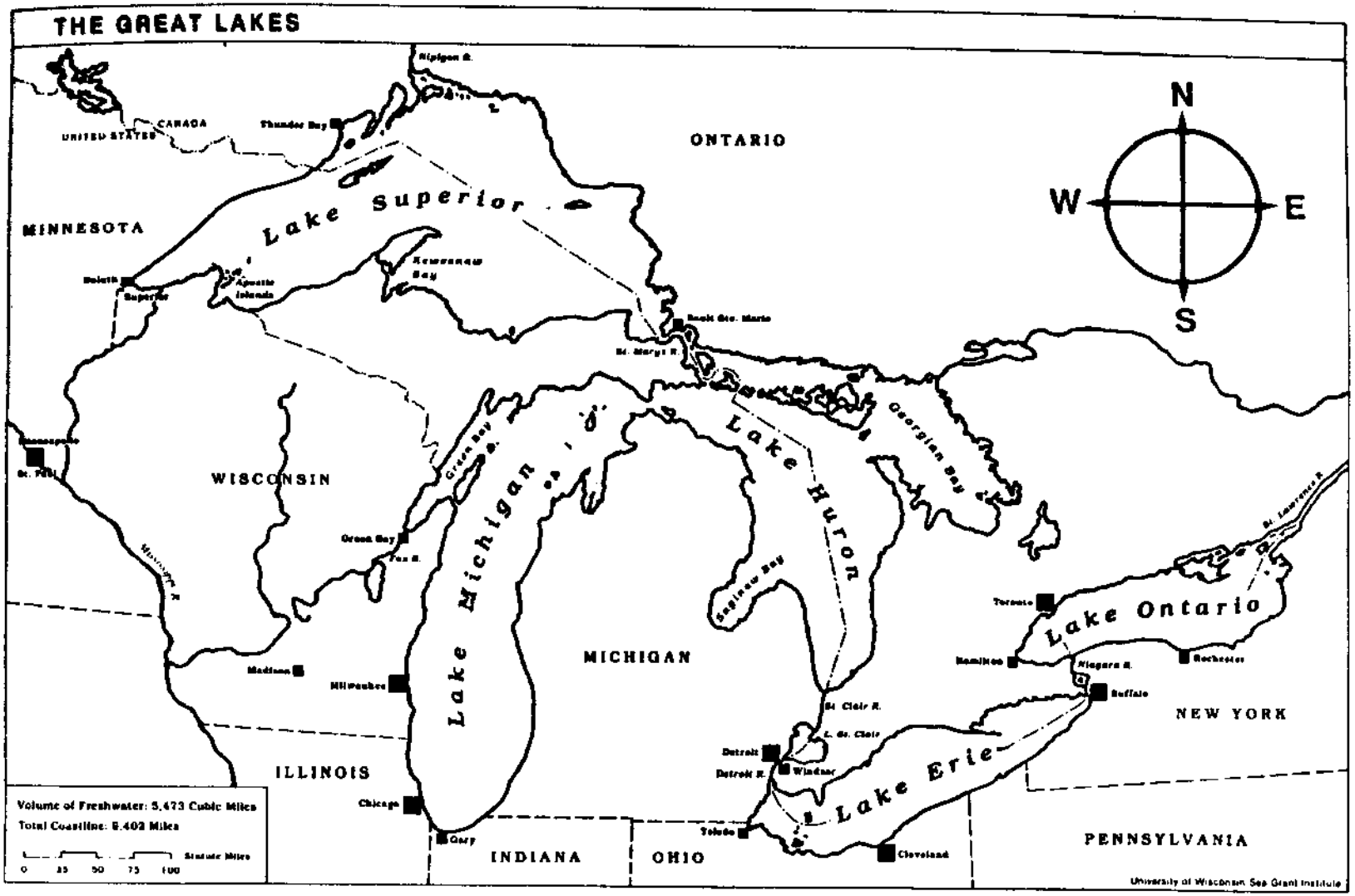
SAILOR MATH — Have the class, as sailors, use strings, paper clips, or rulers to determine which Great Lake is the longest, shortest, widest, or narrowest. Have your sailors determine whether it is farther by land or by water from one selected point to another.

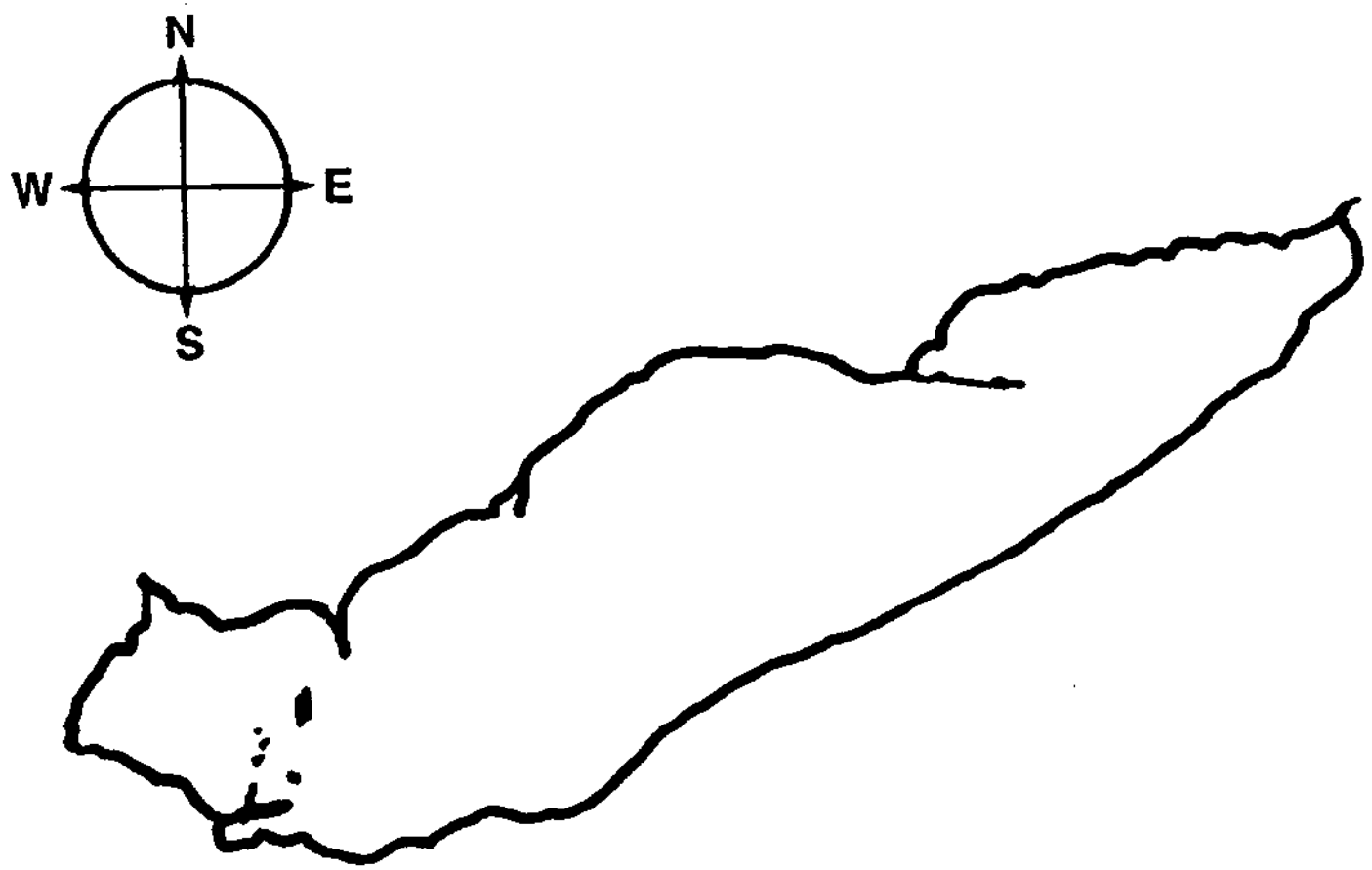
LAKE ERIE BASINS — Divide Lake Erie into three basins. Outline the Western Basin in red, the Central Basin in yellow, and the Eastern Basin in blue. Have students determine their home basin and mark it with a star. List the chief port or ports in each basin.

MAP AND GLOBE WORK — Find the Great Lakes and surrounding states on several different globes and maps. Using a contour map, find and mark the deepest point in Lake Erie (210 feet deep off Long Point in the Eastern Basin).


N
W
E
S
Great Lakes


Great Lakes States


THE GREAT LAKES
UNITED STATES
CANADA
Thunder Bay
ONTARIO
N
W
E
S
MINNESOTA
Lake Superior
Duluth
Superior
Apostle Islands
Keweenaw Bay
Sault Ste. Marie
St. Marys R.
Georgian Bay
WISCONSIN
Green Bay
Lake Michigan
Lake Huron
Saginaw Bay
Green Bay
Fox R.
Madison
Milwaukee
MICHIGAN
Toronto
Lake Ontario
Hamilton
Niagara R.
Rochester
Buffalo
NEW YORK
St. Clair R.
L. St. Clair
Detroit
Detroit R.
Windsor
Lake Erie
ILLINOIS
Chicago
Gary
INDIANA
Toledo
OHIO
Cleveland
PENNSYLVANIA
Volume of Freshwater: 5,473 Cubic Miles
Total Coastline: 8,402 Miles
Statute Miles
0 25 50 75 100
University of Wisconsin Sea Grant Institute



Lake Erie

Great Lakes

Cut and paste the correct name on each Lake.

	Lake Erie	Lake Michigan	Lake Huron	Lake Superior	Lake Ontario	

The Great Lakes

1. Cut and paste the Lakes in the correct locations.
2. Unscramble the names.
3. Cut and paste the correct name on each Lake.

reiE	rnHuo	pirSruoe	gihniMca	aOtorni

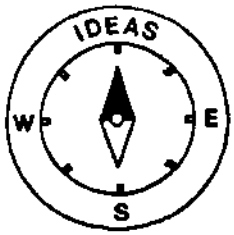
Put the Great Lakes Area in ABC order!

Great Lakes	Great Lakes States
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
	6.
	7.
	8.

Compare the Great Lakes!

1. the largest:
2. the smallest:
3. the farthest west:
4. the farthest east:
5. the farthest south:
6. the farthest north:
7. state and lake with same name:
8. 2 lakes connected to 4 states:
9. state surrounded by 4 lakes:
10. Ohio's Great Lake:
11. New York's Great Lakes:
12. Wisconsin's Great Lakes:


The Great Lakes
Superior
Michigan
Huron
Erie
Ontario



IDEA GUIDE FOR TEACHERS:

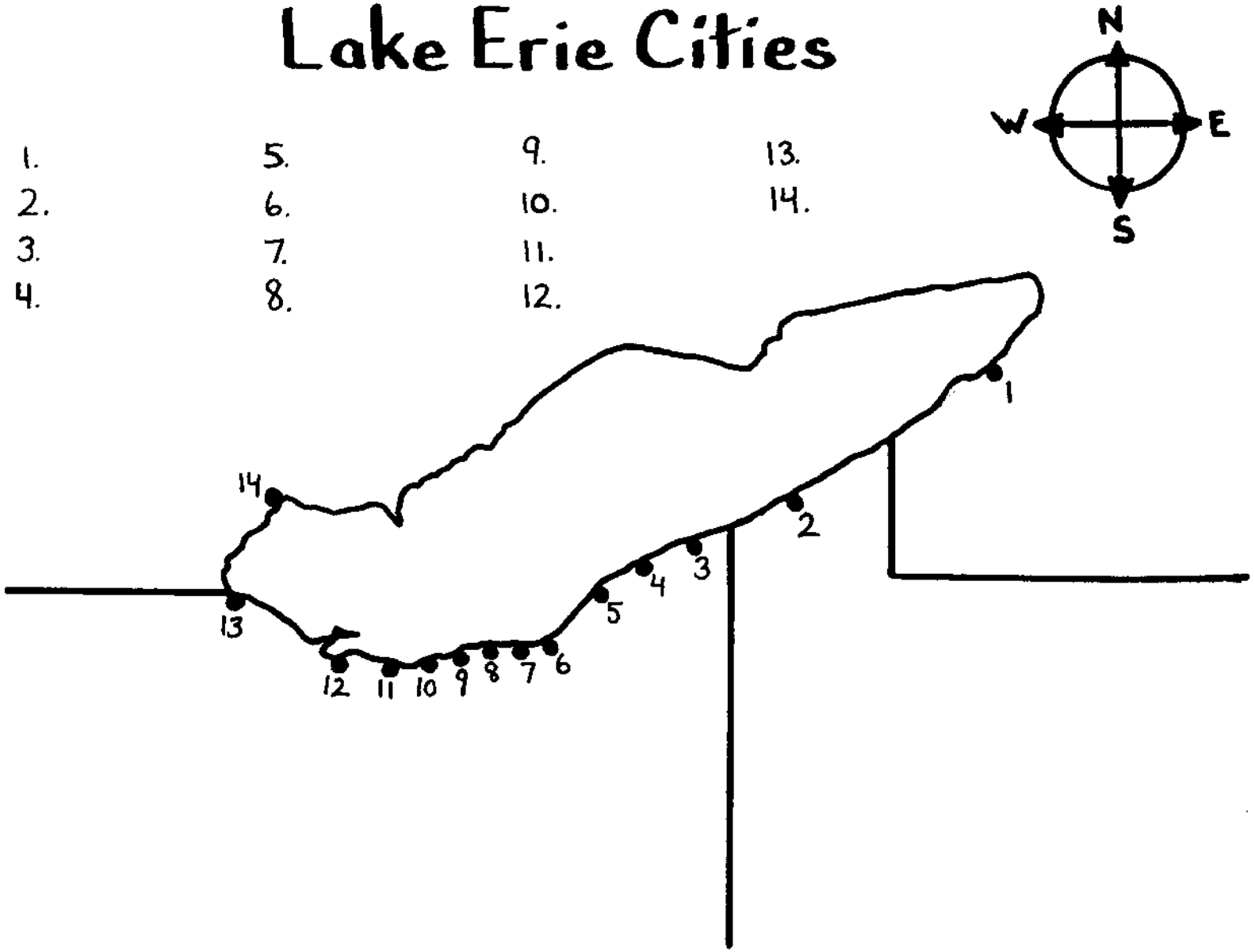
TOUR OF LAKE ERIE CITIES

Select one or more of the following activities to teach and reinforce ideas about Lake Erie cities. All of these activities are easily adaptable to any of the Great Lakes. An encyclopedia provides information on ports for each lake.

OVERHEAD	Turn the Lake Erie Cities page into an overhead transparency using a copy machine or thermofax.
NAME THAT CITY	Map all the Lake Erie cities listed or use any number appropriate for your class. Be sure to include the four chief ports: Buffalo, Detroit, Toledo and Cleveland. Then add your city and any other cities your students want to include (places they have been, where their relatives live, or where they would like to go).
MAKE WAY FOR LAKE ERIE	Use yarn to make a huge Lake Erie shape on the floor. Select as many students as the number of Lake Erie cities you are studying. Give each student a sign with a city name. When the name of a city is called out, the student with that tag finds his/her correct location by looking at the overhead. Or have the students find the position of their city on the yarn outline. Then each student calls out the name of his/her city.
DOT TO DOT	Have each student use a piece of yarn to trace or form a Lake Erie shape on a piece of paper. Then the students mark the Lake Erie cities with red dots and label each one. As an alternative, students can exchange papers and label each other's cities.
LAKE ERIE CITY FOR A DAY	Feature a Lake Erie city for a day. Students bring in pictures, post cards, souvenirs, or other things pertaining to that city.
HOW FAR?	Measure the distance from one Lake Erie city to another. Plan trips and measure the distance from your city to your destinations.
RESEARCH ON ROCKS	Students do library research to find out about the kinds of rocks that lie under each city: limestone, shale, sandstone, beach sand, and glacial till.

Lake Erie Cities

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.



LAKE ERIE CITIES

ANSWERS

1. Buffalo
2. Erie
3. Ashtabula
4. Mentor
5. Cleveland
6. Rocky River
7. Bay Village
8. Avon Lake
9. Lorain
10. Vermilion
11. Huron
12. Sandusky
13. Toledo
14. Detroit

How Lake Erie Got its Name...

Iroquois Indians lived on the south shores. Their word "Erige" means panther.

OR

Lake Erie was named for the Erie Indians who first lived on its shores.

Complete the panther and the Indian. Color!

OUR GREAT LAKE ERIE

GLACIAL BEGINNINGS

Lake Erie is a magnificent natural feature whose formation, and sometimes even existence, is rarely pondered. We often accept our blessings without much further thought.

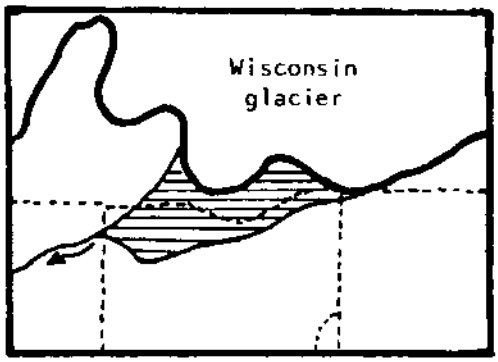
A simple assumption would tell us that the lake has always existed in its present form. But to be so presumptuous would not recognize the dynamic qualities of the earth.

In reality Lake Erie is a relatively youthful body of water, not much more than 9,000 years old. It owes its existence to the last of the great Ice Age glaciers, which reached out from Canada during the Pleistocene and held this region in its powerful grip, shaping the land and forming the Great Lakes.

Following the final deposition of sedimentary rock some 200 million years ago the Great Lakes region underwent a long period of erosion. Preglacial rivers and streams formed a system of valleys, which later provided avenues of easy access for the series of glacial advances which have occurred within the last two million years. It was the most recent of these glaciers, the Wisconsin, which formed the present lakes.

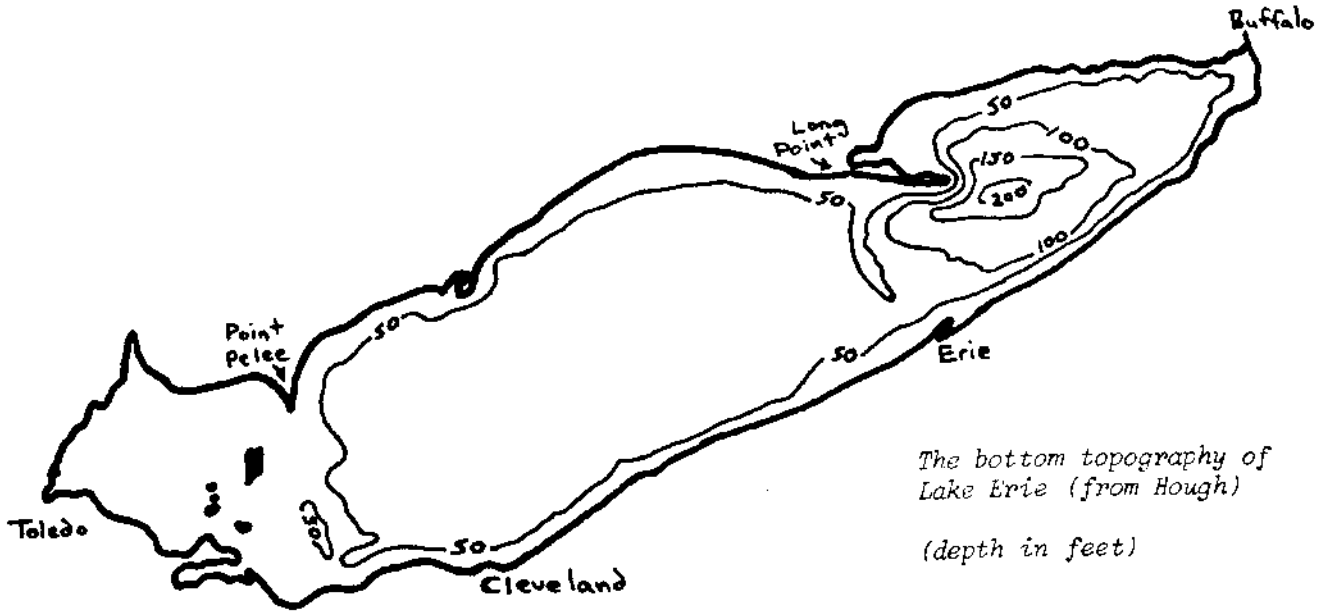
Approximately 27,000 years ago the Wisconsin glacier moved across what is now the Lake Erie basin. The glacier's one-mile thick ice scraped and gouged the land, pushing debris further south, where it was later deposited. And what was left behind, temporarily entombed in ice, was a deepened river valley.

Following a period of perhaps 12,000 years, during which time much of Ohio was dominated by ice and snow, the glacier retreated to the point where glacial meltwater filled the now-exposed basin. Lake Maumee was the name given to this first of the glacial lakes, a body of water which extended south and west from the ice margin to near present-day Fort Wayne, Indiana.



Lake Maumee (from Hough)

Then, after another 5,000 years or so, and following a succession of maybe a dozen more lakes, the glacier retreated far enough north that Lake Erie took on its present configuration. A series of beach ridges, many of which are quite evident at various locations away from the present lake shore, serve as evidence of these former lakes. In many instances roads run along much of the length of these old shorelines. Also, the Great Black Swamp, now a rich agricultural region in northwest Ohio, was a remnant from the time when Lake Maumee flooded the land.



The bottom topography of Lake Erie (from Hough)

(depth in feet)

Lake Erie is the most shallow of the Great Lakes, its average depth being only about 60 feet. Topographically, the lake is divided into three basins: the shallow western basin, the broad central basin and the deep eastern basin. It is in this eastern portion of Lake Erie, off Long Point, where the lake bottom reaches its deepest point of 210 feet.

Variations in lake depth are due, at least in part, to the kind of bedrock and angle at which the rock layers lie. East of Sandusky, Ohio, the lake was excavated in soft Devonian shales, and, therefore, is deeper than the western basin, which was formed in more resistant limestone and dolomite. The Lake Erie islands of this latter region were formed because of the type of rock, its hardness effectively reducing the amount of glacial erosion. One can see impressive evidence of the force of the glacier by visiting the glacial grooves on Kelly's Island.

Many scientists feel that we are presently in the midst of a temporary glacial retreat, and that another wall of ice will advance into Ohio within the next 100,000 years. Although the reader may never see this chilling event occur it is interesting to consider the changes and resulting difficulties that would arise from such an overwhelming natural phenomenon.

FOR FURTHER INFORMATION:

Geology of the Great Lakes. 1958. J.L. Hough. University of Illinois Press. 313 pp.

Lake Erie. 1945. H. Hatcher. The Bobbs-Merrill Company. 416 pp.

Ohio's Natural Heritage. 1979. M.B. Lafferty, Editor-in-Chief. The Ohio Academy of Science. 324 pp.

OUR GREAT LAKE ERIE series is published by the Lake Erie Nature and Science Center, Bay Village, Ohio. 1985.

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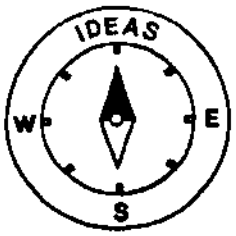


IDEA GUIDE FOR TEACHERS:

GLACIER EXPERIMENT

PURPOSE: This experiment will demonstrate some of the effects a glacier has in molding and carving the land.

MATERIALS: Plasticene clay, large tray or stream table, pebbles, rocks, water, and paper milk cartons.

PROCEDURE:

1. Spread clay on the stream table or tray. Vary the thickness of the clay in different areas.

2. Make "glaciers." Put pebbles and rocks in the bottom of paper milk cartons, then fill the cartons with water and freeze. When the water has frozen solid, remove the blocks of ice from the cartons.

3. Move the "galciers" across the clay, then allow the ice to melt. Try these variables:
   a. Exert different amounts of pressure on the ice as you move it over the clay.
   b. Make the ice melt fast.
   c. Make the ice melt slowly.
   d. Use different sizes and amounts of pebbles and rocks in the ice blocks.
   e. Use hardened Plaster of Paris instead of clay to represent more resistant rock layers.

THINK IT OVER:

1. How did the blocks of ice act like glaciers?
2. What were the effects of the different pressures?
3. What happened when the ice melted fast? slowly?
4. How does this experiment relate to Lake Erie?
5. Did the real glaciers melt fast or slowly?
6. If we had another glacial period, what would happen to our homes, towns, businesses, rivers, etc.? You may want to set up some of these on the clay and repeat your experiments.

EXTENSION:

1. Take a field trip to Kelley's Island to see the glacial grooves, or look at pictures of them with the class.
2. Invite a resident of Kelley's Island to visit the class.
3. Discuss the glacial grooves. How did they happen?
4. How have glaciers hurt and helped Kelley's Island?

Fact Sheet 16

Lake Erie Facts

by Jeffrey M. Reutter, Associate Director, Ohio Sea Grant

Lake Erie is a statewide resource; an asset to the entire state of Ohio. In fact, many people consider Lake Erie to be the most important lake in the world. Some of the justification for this belief is outlined below:

- More fish are produced each year for human consumption from Lake Erie than from the other four Great Lakes combined -- Lakes Huron, Michigan, Ontario and Superior.
- Almost as much coal is shipped from Ohio ports each year as is mined within the state.
- The largest fossil-fueled power plant in the world is located on Lake Erie at Monroe, Michigan.
- The western end of Lake Erie is the "Walleye Capital of the World," producing more walleye per hectare than any other lake in the world.
- One of the largest amusement parks in the world is located on Lake Erie at Cedar Point.
- Some of the largest ships operating on the Great Lakes -- in excess of 1,000 feet in length -- have been built at shipyards in Lorain, Ohio and Erie, Pennsylvania.
- Each day over 11 million people get their drinking water from Lake Erie.
- The only National Estuarine Sanctuary on the Great Lakes is located at the mouth of Old Woman Creek near Huron, Ohio, the southernmost point on the Great Lakes.
- There are over 250 marinas along Ohio's 262 miles of shoreline and almost 100,000 of Ohio's 400,000 registered boats (8th highest in country) use Lake Erie as their primary boating area.
- Each year Ohio sport fishermen spend almost 15 million man-hours fishing on Lake Erie.
- Each year Ohio sport fishermen catch over 25 million fish on Lake Erie.

Ohio Sea Grant Advisory Service
484 W. 12th Ave. / Columbus, Ohio 43210 / (614) 422-8949

Ohio Sea Grant Program - Ohio Cooperative Extension Service
THE OHIO STATE UNIVERSITY

- The average walleye fisherman on Lake Erie comes from 86 miles away. Twenty-four percent come from 100-150 miles away and 10 percent come from over 150 miles away.

- Over 100 species of fish are found in Lake Erie, and over 300 species of birds have been observed in the island area.

- Lake Erie and its shoreline are major sources of many minerals. The largest sandstone quarry in the world is located at Amherst, Ohio. Salt mines located near Cleveland extend out under Lake Erie and are important as a source of revenue to the state. Sand, gypsum and limestone, used for construction purposes, are found in abundance, and large reserves of natural gas, over 13 trillion cubic feet, are found under Lake Erie.

- The outlet for Lake Erie is Niagara Falls, consequently it is Lake Erie water that flows over these falls.

- Lake Erie is the 12th largest freshwater lake in the world. It is the 4th largest of the Great Lakes and the smallest by volume.

- Lake Erie is the shallowest, warmest and most biologically productive of the Great Lakes.

- The snow belts east of Cleveland are the result of moisture-laden air moving over the land from the lake. These storms are known as lake-effect snowstorms.

- Lake Erie is completely covered by ice more often than any of the other Great Lakes. Annually, the western basin freezes from shore to shore providing recreational ice fishing, snowmobiling and ice boating.

- The famous quotation, "We have met the enemy and they are ours," was made by Oliver Hazzard Perry during the battle of Lake Erie in the War of 1812.

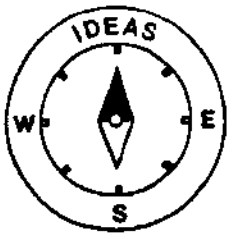
- Geologically, Lake Erie was the first of the Great Lakes formed; however, it was the last of the Great Lakes to be discovered by Man.

- The beautiful international island archipelago located in the western basin of Lake Erie is a tourist mecca.

- Each year millions of people use the swimming beaches along Lake Erie.

- Toledo and Conneaut, Ohio, are the largest coal-shipping ports on the Great Lakes. Each year millions of tons are shipped overseas.

- Utilization and development of Lake Erie is continuing to grow as evidenced by the construction of two new nuclear power plants on its shores, the increase in the number of charter fishermen from 34 in 1975 to approximately 600 in 1984, and the increase in sportfishing effort from approximately 7 million man-hours in 1976 to approximately 15 million now.



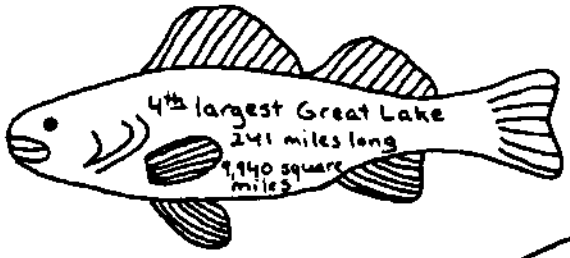
IDEA GUIDE FOR TEACHERS:

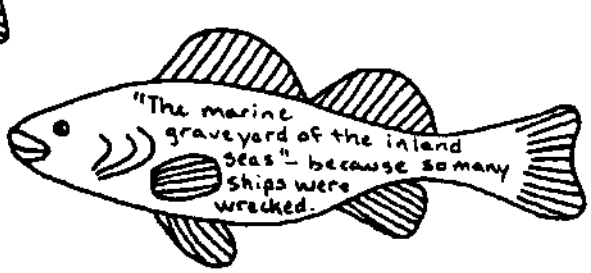
IT'S A FACT

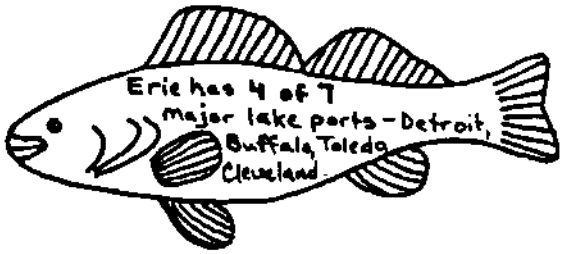
Select one or more of the following activities to teach and reinforce Lake Erie facts. Each of these activities can be adapted to any elementary grade or to any local body of water.

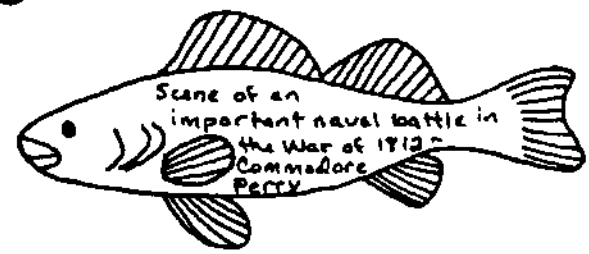
BULLETIN BOARD	Use a huge cutout of Lake Erie for a bulletin board. Each day, attach a new fish (from the next page) which has a Lake Erie fact on it.
HIDE AND SEEK	Cut Lake Erie fact fish apart, glue on cardboard, and hide them around the room. Students discuss the facts as they find them.
STRIPPING TO THE BARE FACTS	After discussing a Lake Erie fact, have a student write that fact on a sentence strip. Add illustrations and display the sentence strips around the room.
NET A FEW FACTS	Get a fishing net. Cut out the Lake Erie fact fish and put them in the net. Students take turns putting on a fishing hat and pulling out a fish. Read and discuss each Lake Erie fact.
ATTRACTED TO THE FACTS	Cut out Lake Erie fact fish, glue them on cardboard, and attach apaperclip to each. Get a fishing pole, or use a dowel with a piece of string attached. Fasten a magnet to the end of the line. The magnet attracts the paper clips on the fishy facts.
A STEP FORWARD	Select ten students to hold Lake Erie facts printed on large cards. The teacher reads a fact, then the student holding that fact steps forward.
LAKE ERIE CLUES	Students hold Lake Erie fact cards. The teacher gives a clue to a fact, and the student holding the correct fact steps forward.
MOBILE	Make a Lake Erie fact mobile. Cut out a Lake Erie shape and suspend fact fish from it.
COLLAGE	Students collect pictures illustrating Lake Erie facts. Create a collage for each fact.
BACK WITH THE FACTS	Each student has a fact pinned to his/her back. Students question each other until they guess the fact pinned to their own back.
LAKE ERIE BOOK	Cut two Lake Erie shapes from blue construction paper to make front and back covers for a booklet. Cut writing paper to the same shape for the pages. On each page, students write a Lake Erie fact and illustrate it.

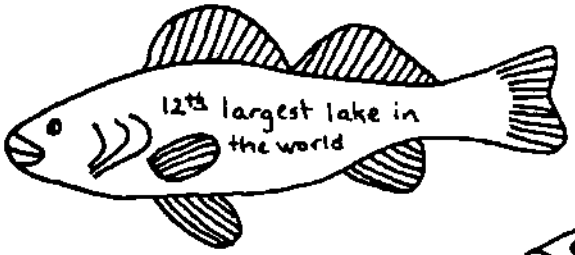
Lake Erie Take A Bow

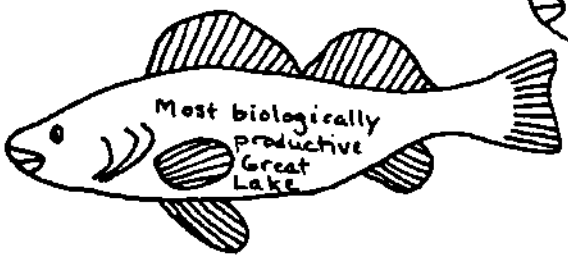


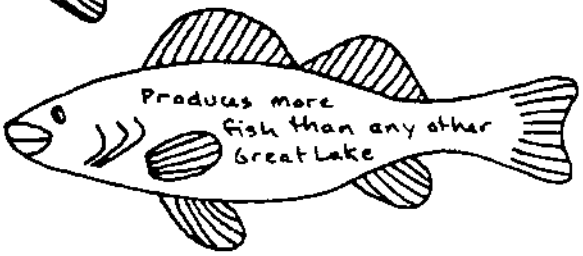




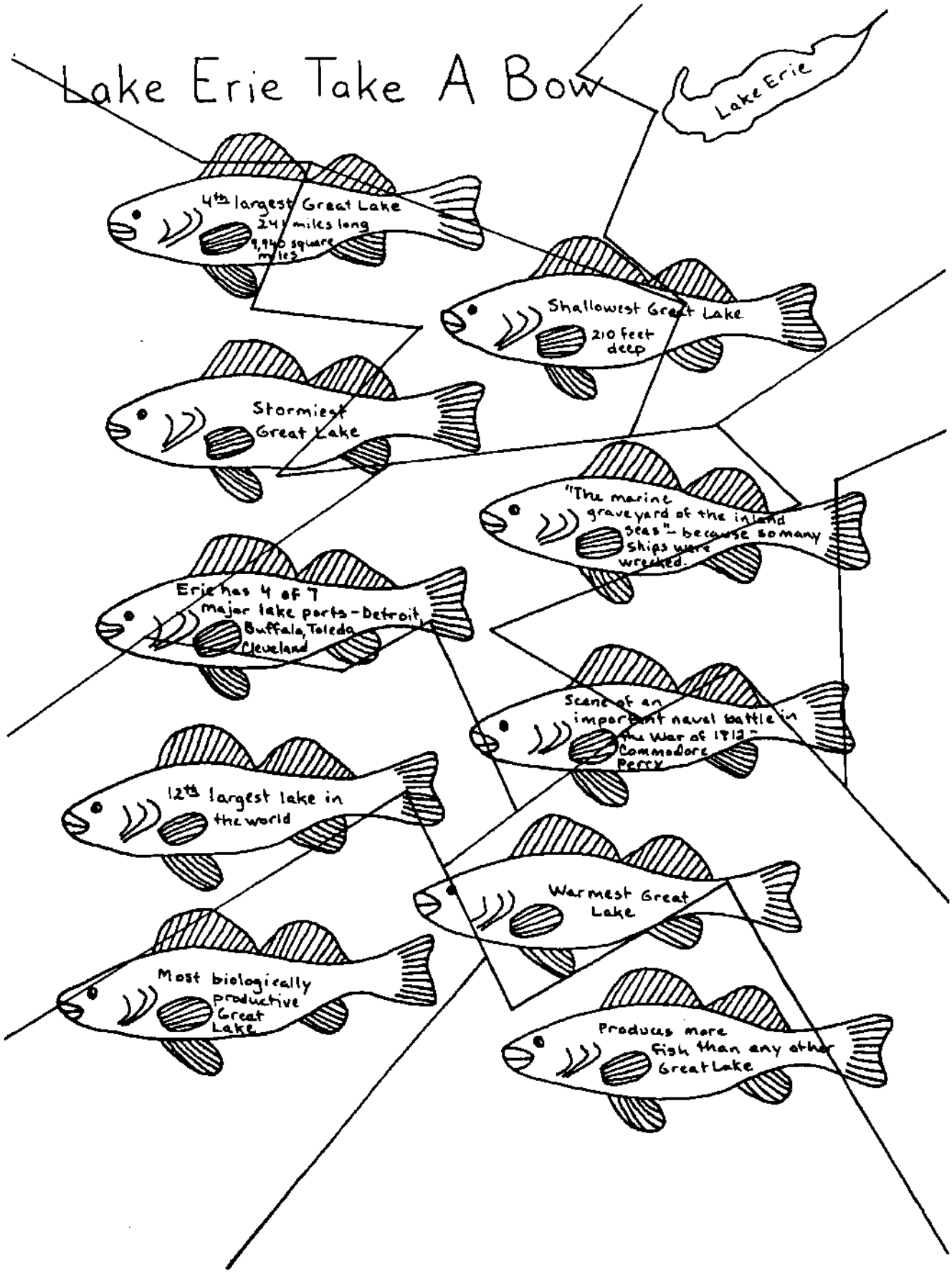


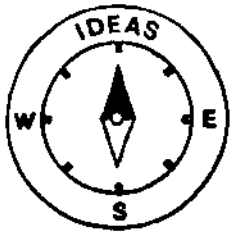






Lake Erie Take A Bow





IDEA GUIDE FOR TEACHERS:

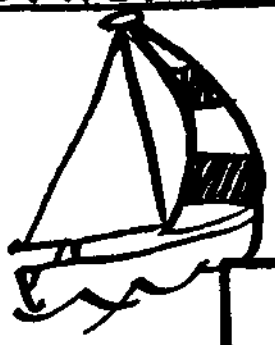
LAKE ERIE -- WHAT'S THE USE

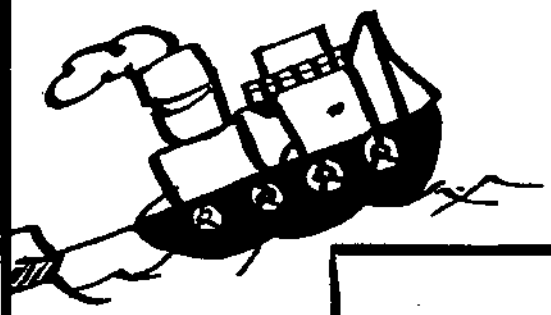
Select one or more of the following activities to teach and reinforce ideas about Lake Erie's uses. Each of the activities can be adapted to any elementary grade and to any body of water.

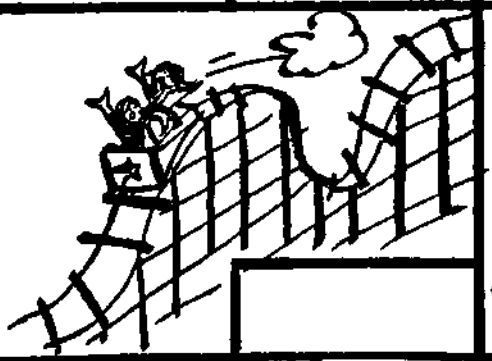
OVERHEAD	Turn the Lake Erie Uses page into an overhead. Have the class brainstorm the chief uses of Lake Erie.
ABC	Write the alphabet down the side of a page. As a group, identify and record uses of Lake Erie that begin with each letter.
CLASS LIST	Each student writes down all the uses of Lake Erie that he/she can think of, then the class makes a composite list.
LAKE ERIE MOBILE	Students draw or write uses of the lake on circles of cardboard. Hang the circles from a Lake Erie shape to make a mobile
READY, SET, GO	Divide the class into four groups. See which group can list the most uses of Lake Erie in a given amount of time.
I SPY LAKE ERIE	Play a version of "I Spy" -- "I'm thinking of a use of Lake Erie." Give clues and have students guess the use.
MAN ON THE STREET	Have students in pairs or triads write a script for an interview. The interviewer asks the other(s), "How do you use Lake Erie?" As an alternative, the teacher acts as a television news reporter, using a microphone to ask students, "How do you use Lake Erie?"
CHARADES	Groups of students act out charades of the uses of Lake Erie while the other students try to guess the use portrayed.
HIDDEN PICTURES	Hide pictures that illustrate uses of Lake Erie around the room. Students find the pictures and tell what use is shown.
HAIKU	Collectively or individually make up Haiku poetry reflecting the chief uses of Lake Erie. In a Haiku poem, the first line has five syllables, the second line has seven syllables, and the third line has five syllables. Or write a Haiku poem around the shape of Lake Erie.

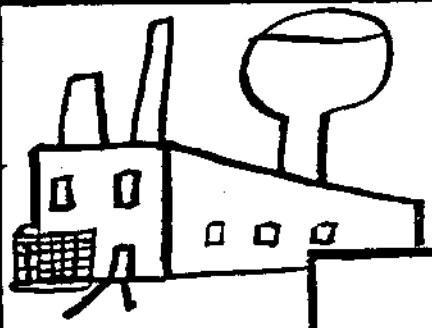
Chief Uses of Lake Erie

Chief Uses of Lake Erie...

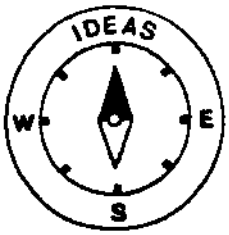








shipping	swimming	boating
fishing	industry	recreation
	agriculture	



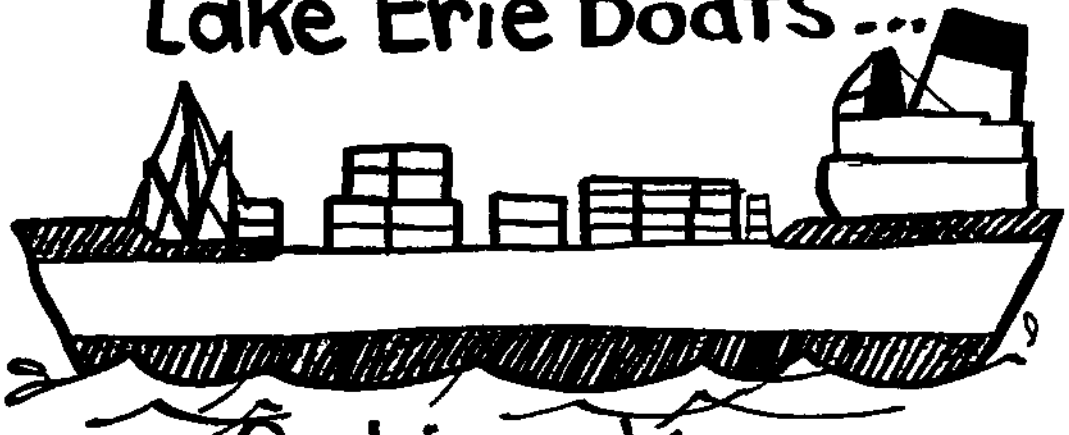
IDEA GUIDE FOR TEACHERS:

ANCHORS AWEIGH

All watercraft on Lake Erie are called boats regardless of their size. Select one or more of the following activities to teach and reinforce information about boats that travel on Lake Erie. All of these ideas can be adapted to any elementary grade and to any body of water where there are boats.

RESEARCH	Do library research on the different types of boats and the work they do.
MOBILE	Create a mobile with Lake Erie boat shapes.
SCRAMBLED WORDS	Scramble Lake Erie boat words for students to unscramble, or have students do it for each other.
WORD SEARCH	Design a Lake Erie boats word search or have students design one.
BOAT GROUPS	Sort Lake Erie boats according to their different characteristics.
BULLETIN BOARD	Create a bulletin board using pictures of the different boats at work.
CREATIVE WRITING	Create stories by completing the following ideas: A. I am an ore carrier. I ... B. While sailing on Lake Erie, I ... C. Lake Erie needs boats because ... D. Boats need Lake Erie because ...
RIDDLES	Think up riddles about Lake Erie boats.
POETRY	Brainstorm some poetry about Lake Erie boats.
MUSIC	Write your own Lake Erie boat song. Select one boat and write the lyrics to the tune of a familiar song such as "Hot Cross Buns."
ABC	Arrange Lake Erie boat words in alphabetical order.
DOT-TO-DOT	Create a dot-to-dot using one or more of the boat shapes, or have students create one.

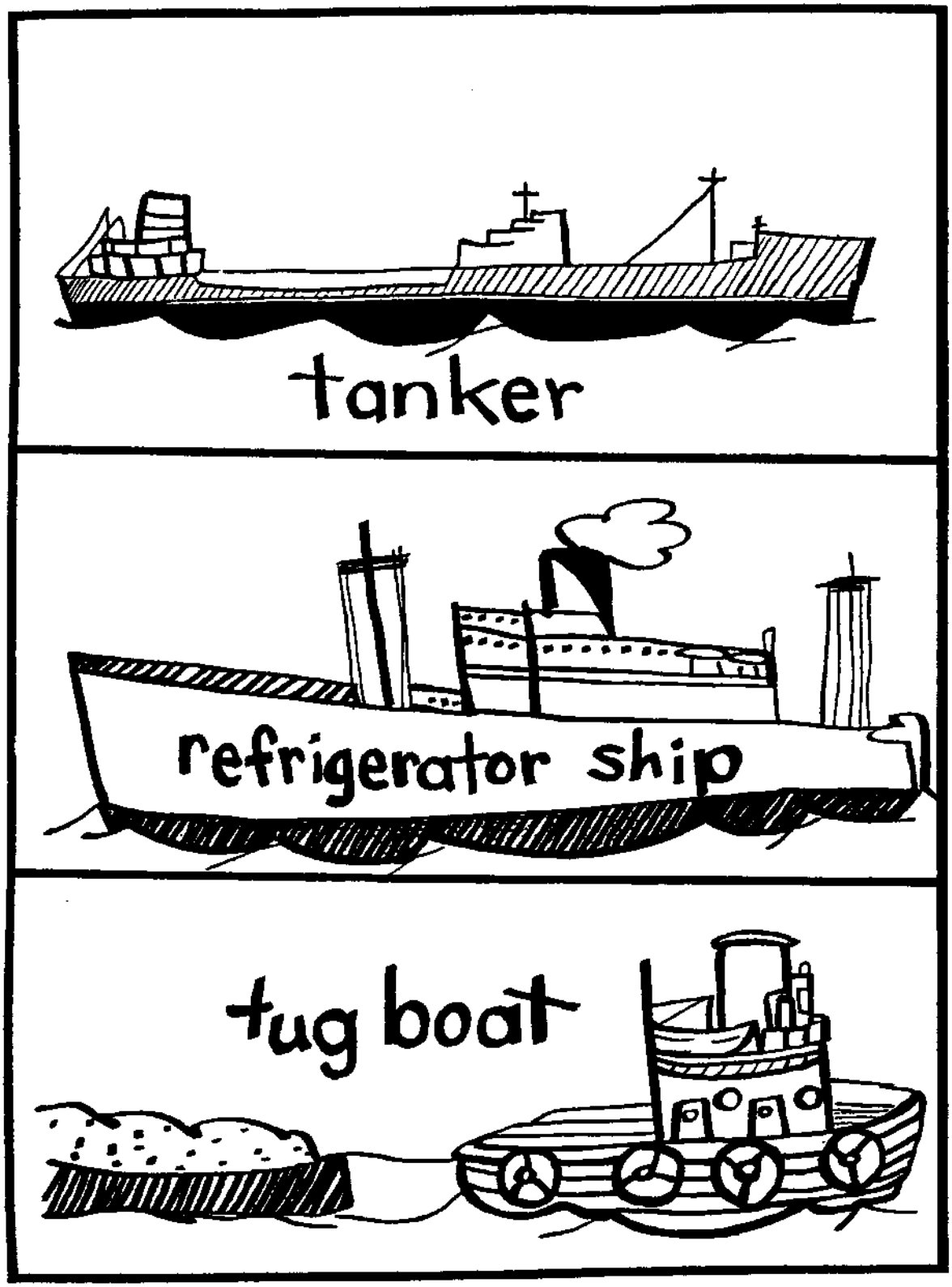
Different Kinds of Lake Erie Boats...

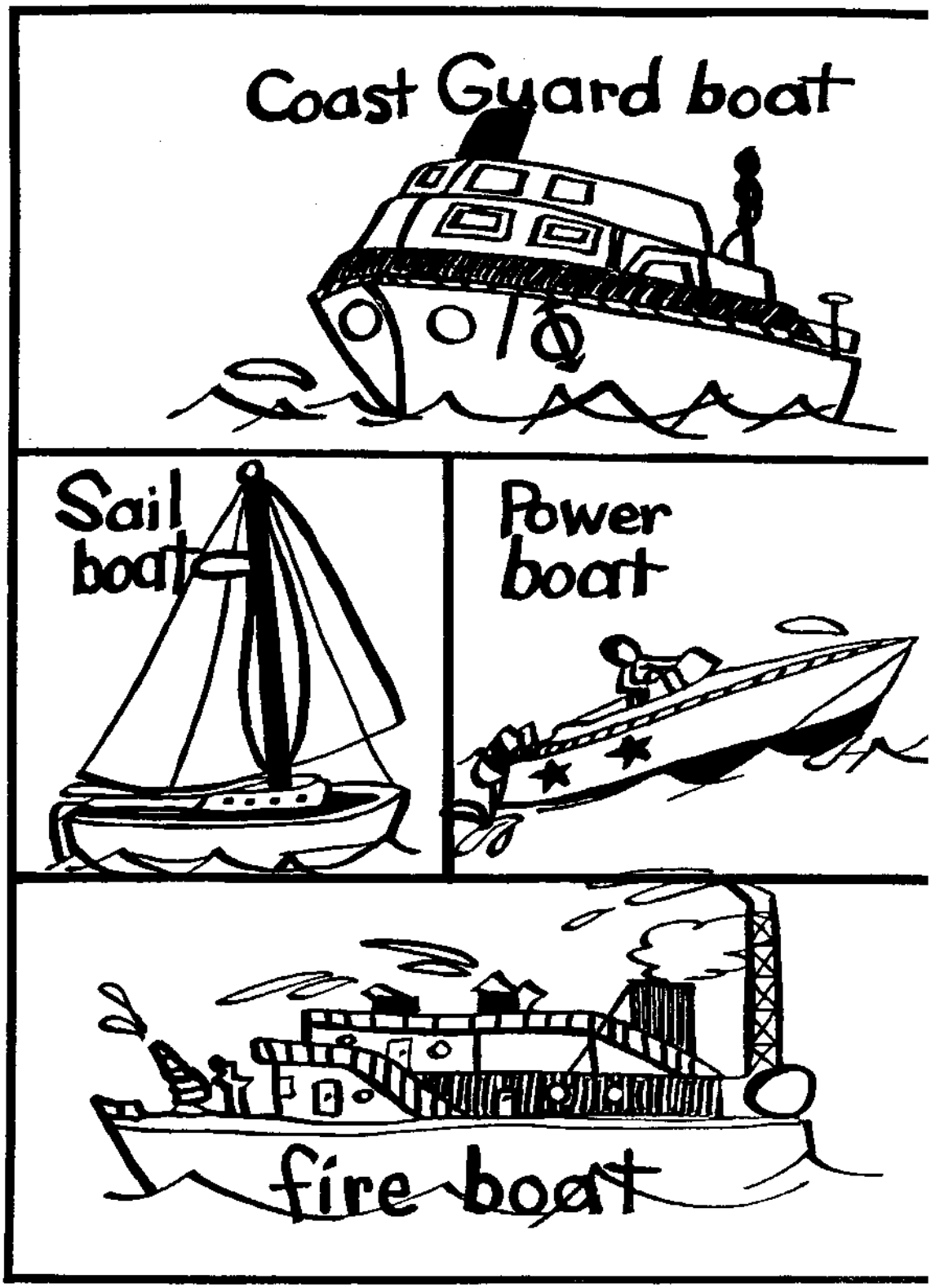


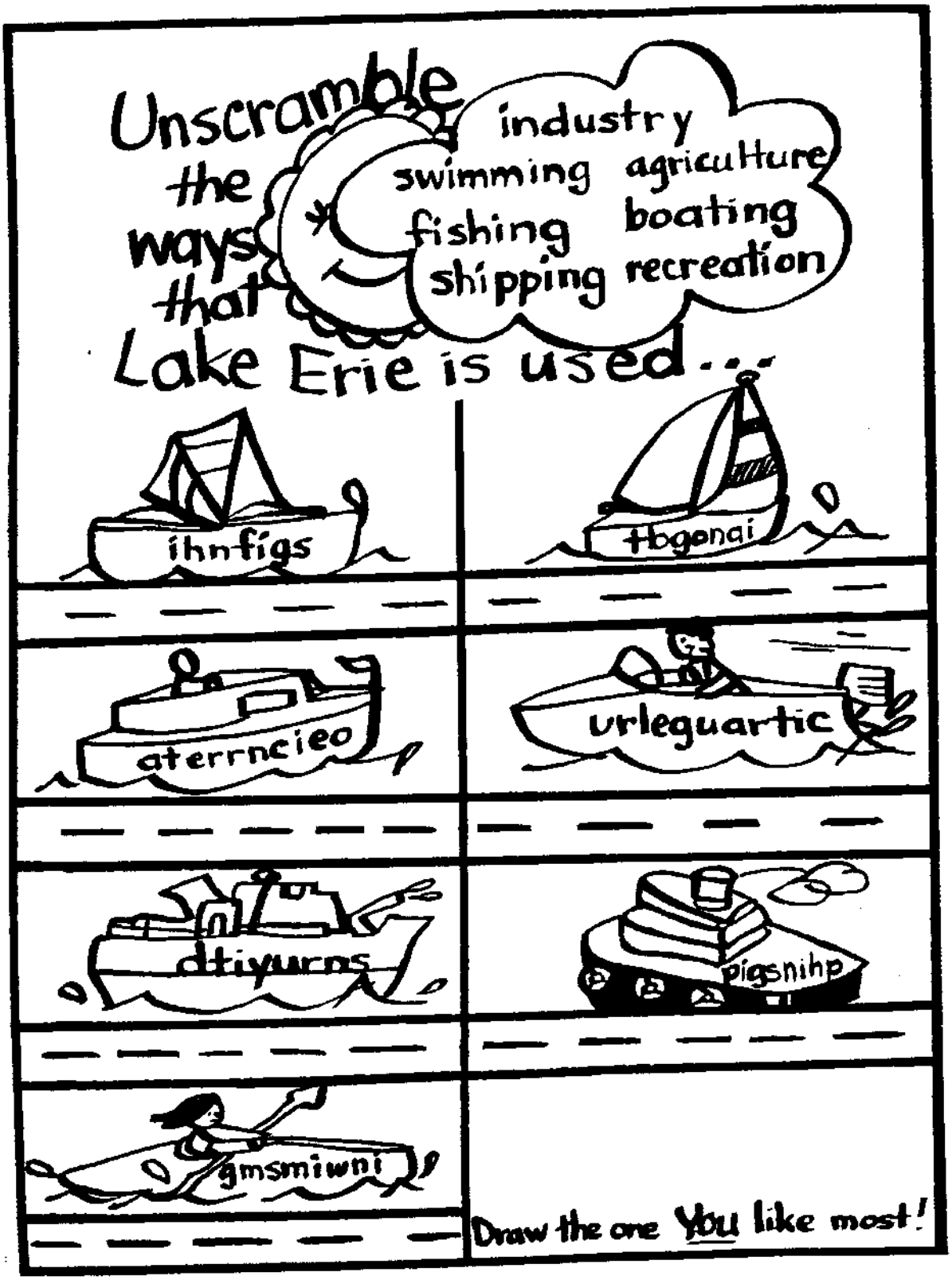
Container ship

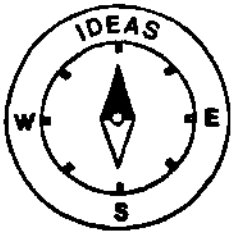
freighter

ore carrier


tanker
refrigerator ship
tug boat


Coast Guard boat
Sail boat
Power boat
fire boat


Unscramble the ways that Lake Erie is used...
industry
swimming
agriculture
fishing
boating
shipping
recreation
ihnfigs
tbgonqi
aterrncieo
urleguartic
dtiyurns
pigsnihp
gmsmiwni
Draw the one You like most!



IDEA GUIDE FOR TEACHERS:

PEOPLE'S ATTITUDES TOWARD LAKE ERIE

DIRECTIONS: Using the eight letters in LAKE ERIE, have the class list words associated with the Lake or feelings that people have toward the Lake. Here is a sample list.

L launch learn liberate loving lasting linger

A attractive active affectionate accepting adaptable adjustable advantage anchor

K kind key knowledge keep know

E eager energetic economical engineer endure employ

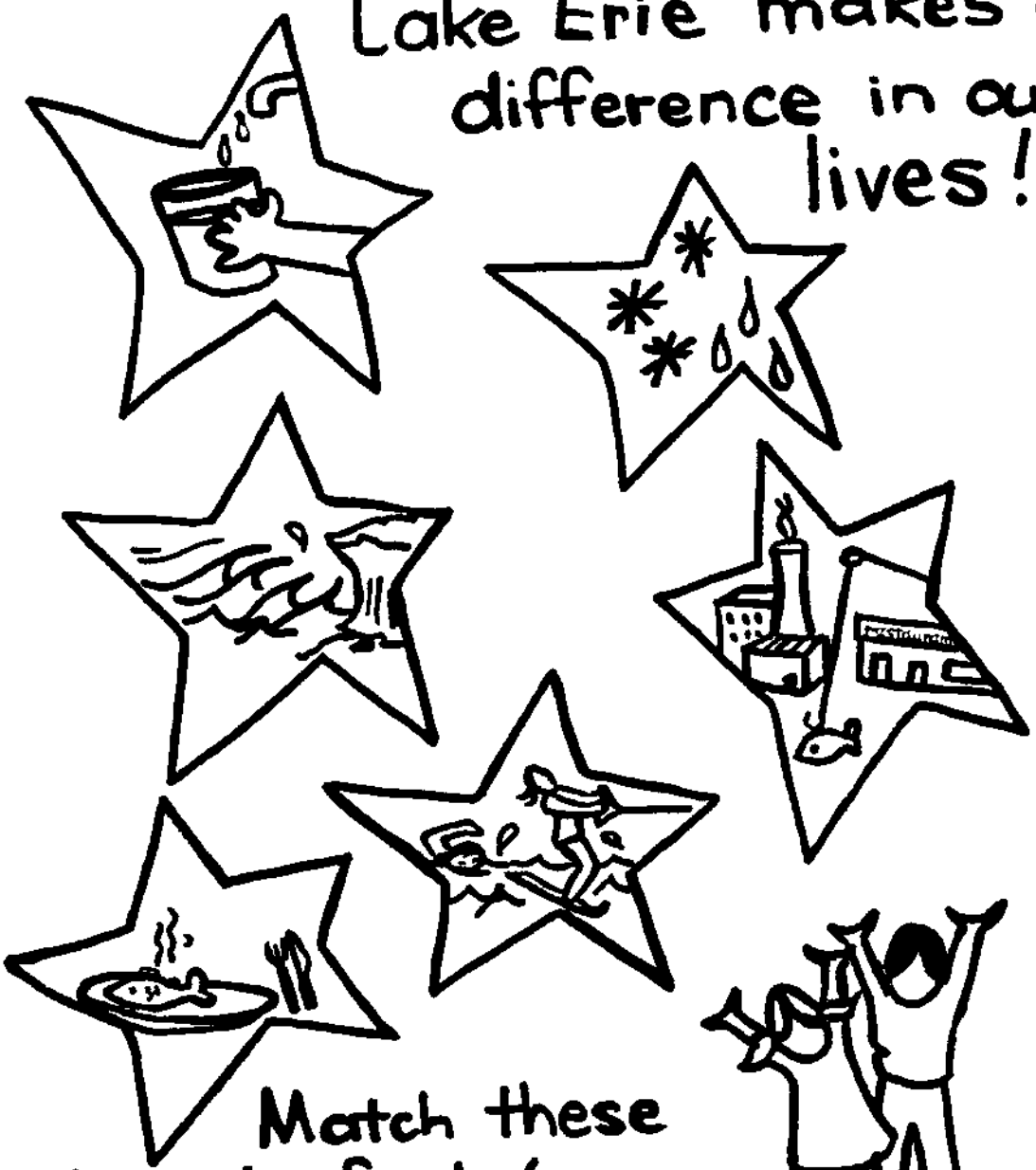
E enriching encourage endeavor effort express exploit

R realize reflect remember rescue rewarding responsibility ready real relieve

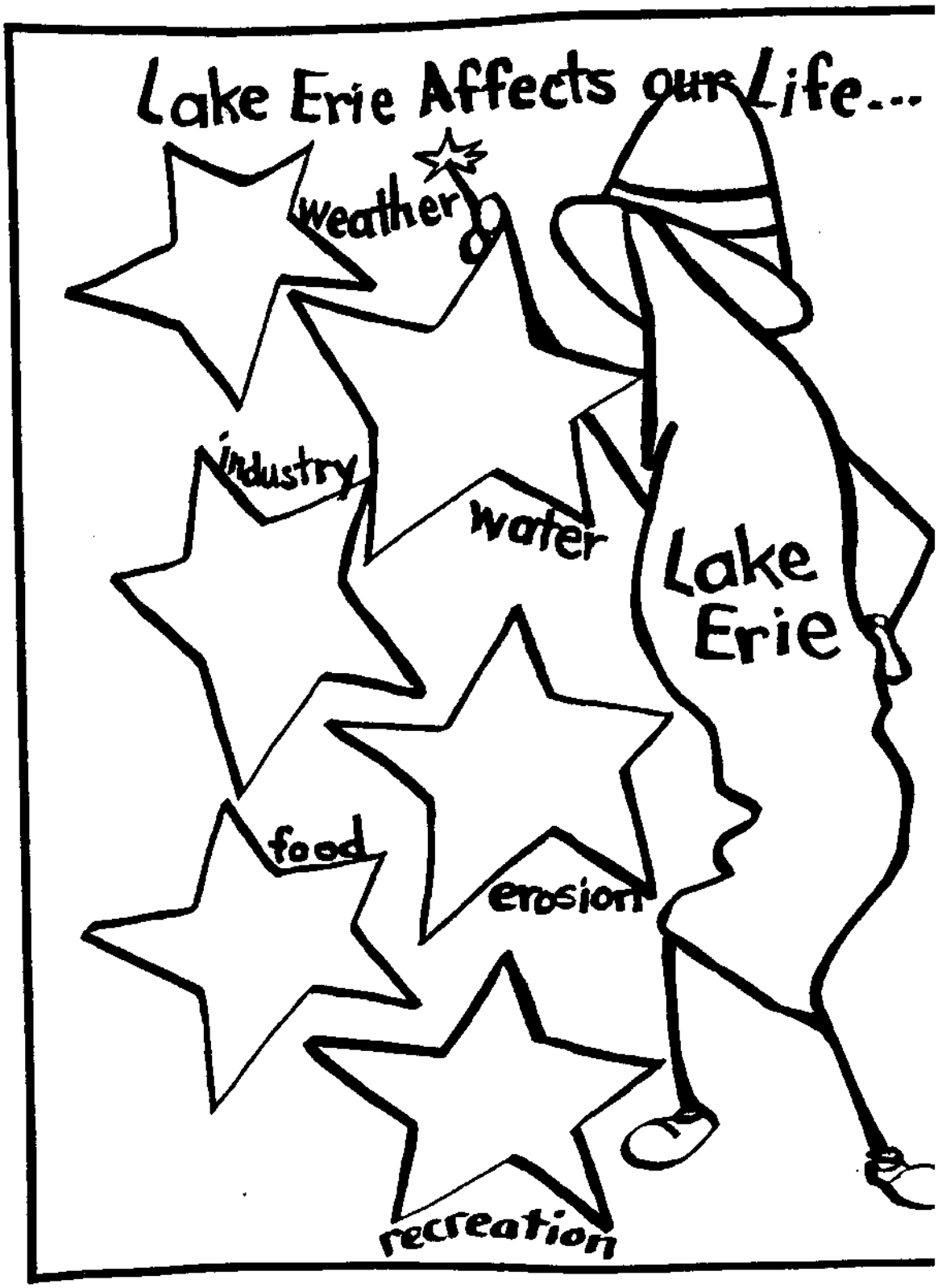
I inquisitive ideal imaginative important impressive improvement

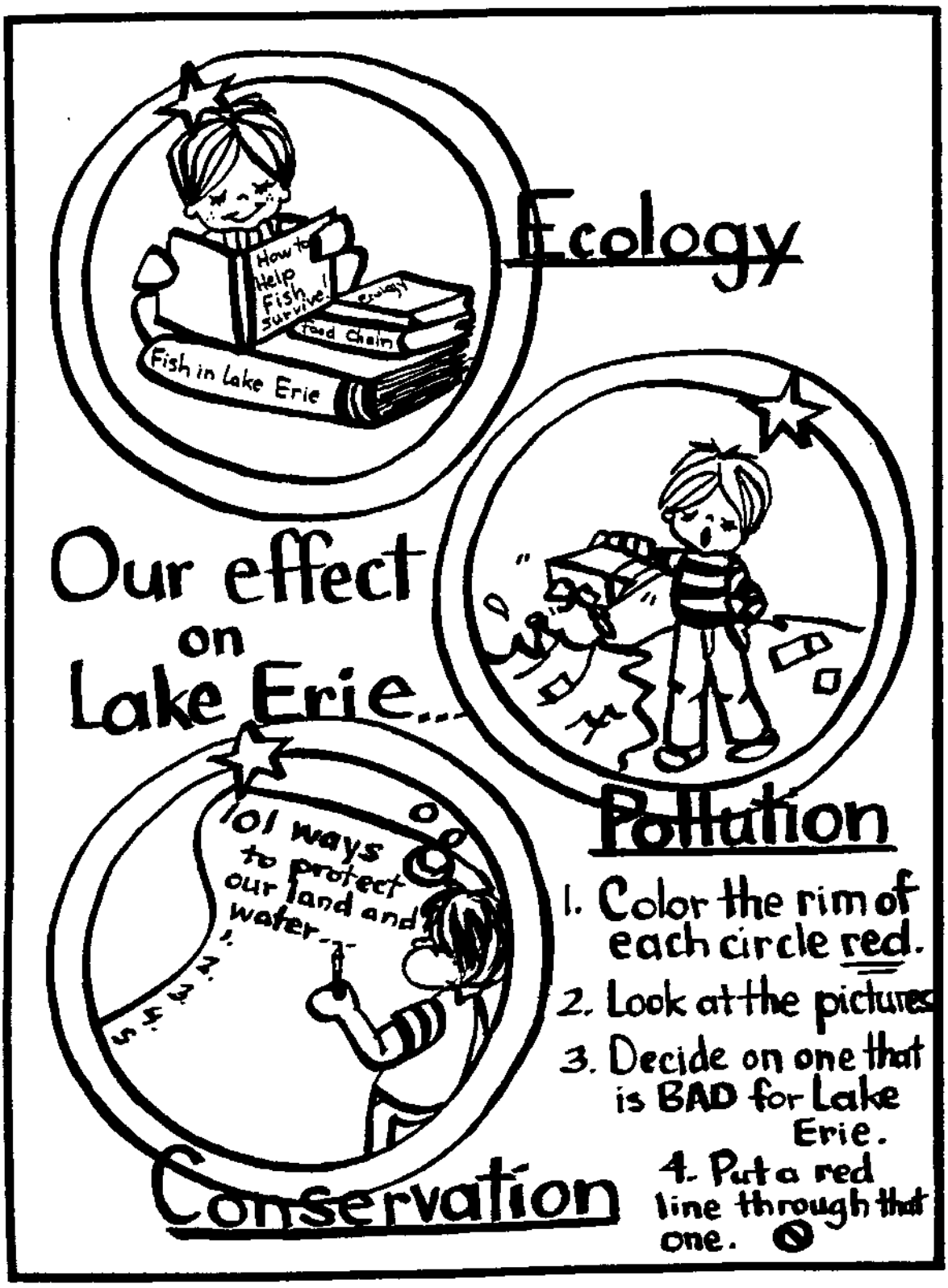
E endorse enjoy envy exhaust expand experience

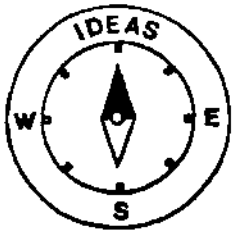
Lake Erie makes a difference in our lives!



Match these stars to find 6 ways Lake Erie touches your life.


Lake Erie Affects our Life...
weather
industry
water
Lake Erie
food
erosion
recreation


Ecology
How to Help Fish survive!
Food Chain
Fish in Lake Erie
Our effect on Lake Erie...
Pollution
101 ways to protect our land and water...
Conservation
1. Color the rim of each circle red.
2. Look at the pictures
3. Decide on one that is BAD for Lake Erie.
4. Put a red line through that one.



IDEA GUIDE FOR TEACHERS:

LAKE ERIE WORD WEB

Choose one or more of the following activities to teach and reinforce ideas about the importance of Lake Erie. Each of these activities can be adapted to any elementary grade or to any body of water.

A WORD WEB begins with a familiar subject as a core concept, then the class generates possible ideas related to the core.

1. Use a circular word web with 'Lake Erie' as the core concept. Have the entire class brainstorm ideas related to Lake Erie. An example is provided. The fun part is to see what finally appears on the outer edges.

   A. Follow a vertical line from 'Lake Erie' to the outer edge of the web and discuss the sequence of terms. For example:
   Lake Erie - fishing - bait - minnow - bucket
   Each of these terms is directly related to the one before it in the sequence.

   B. See what each circle of words has in common. Are all the words important to Lake Erie?

2. Begin a word web and continue adding to it all year. Put the word web words on cards and tape them up in sequential order around the classroom. As the class thinks up new connections, add new cards to your word web.

3. Use a rectangular word web that is divided into two parts to illustrate Lake Erie opposites. Possible pairs of opposites include:

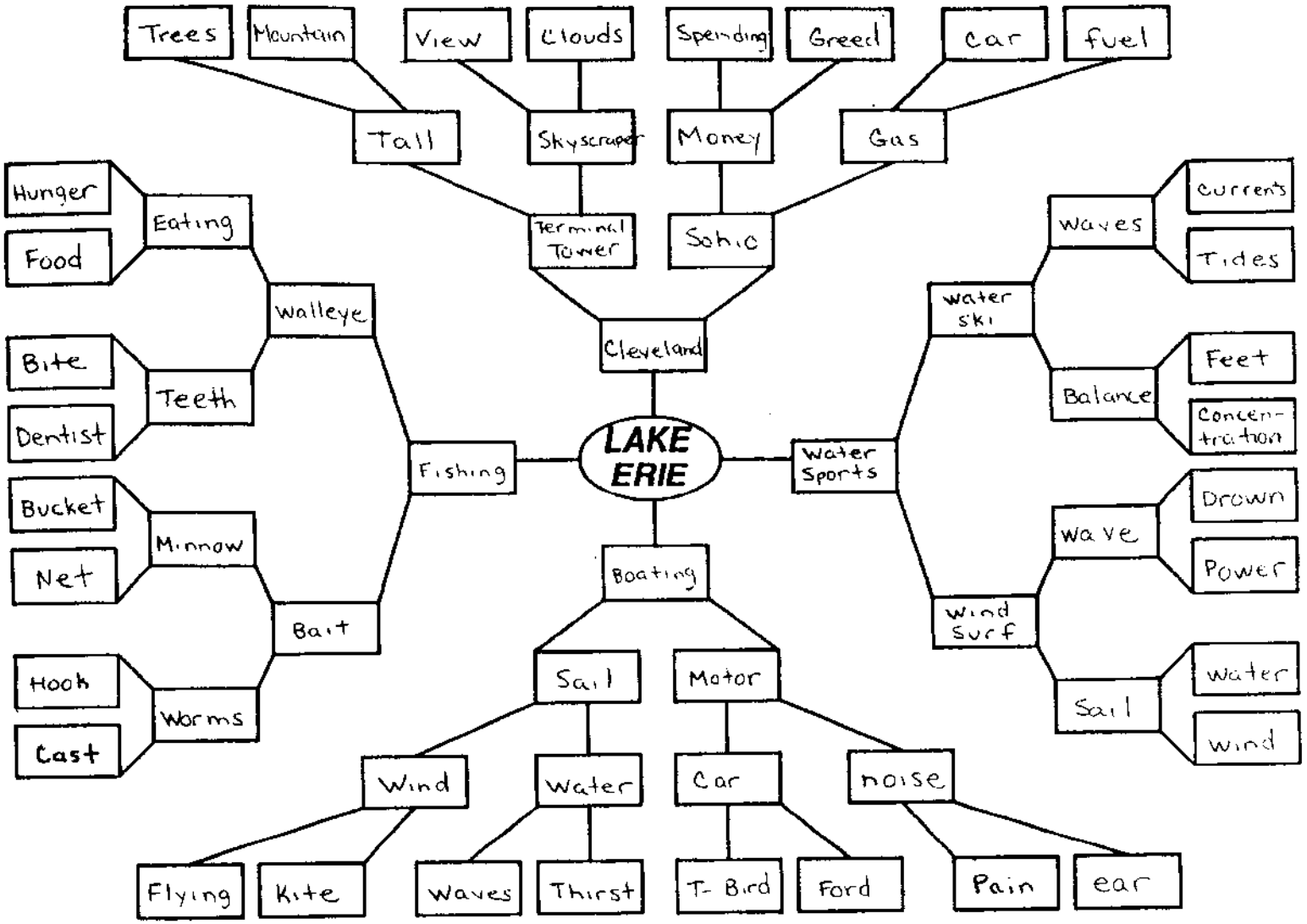
   A. Top half: What your class knows about Lake Erie.
   Bottom half: What your class wants to learn about Lake Erie.

   B. Top half: Living things connected with Lake Erie (fish, habitats, wildlife, etc.).
   Bottom Half: Nonliving things connected with Lake Erie (cities, states, buildings, etc.).

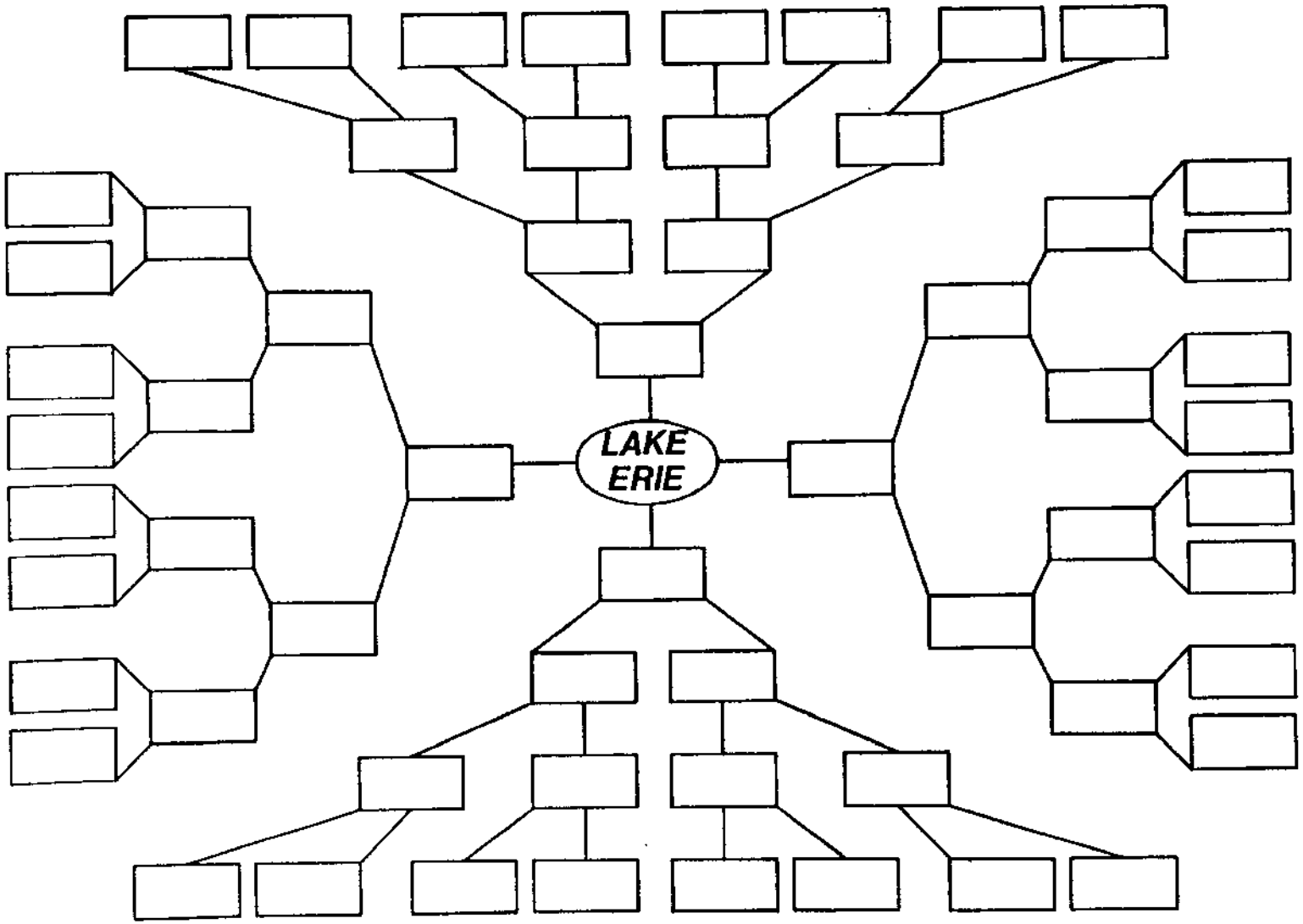
   C. Top half: Lake Erie, the giver.
   Bottom half: Lake Erie, the taker.

4. As a variation, construct a word web in the shape of Lake Erie or of a fish.

5. Use word webs as evaluations to see what students have learned about concepts related to Lake Erie.



Lake Erie Word Web



Lake Erie Word Web

1. Have the class decide upon a Lake Erie shore community that they would like to know more about.

2. Contact a teacher from that community's school system for interest and cooperation in this "sharing" project.

3. Have the class initiating the project brainstorm questions to get to know their hometown community better. (Sample questionnaire included.)

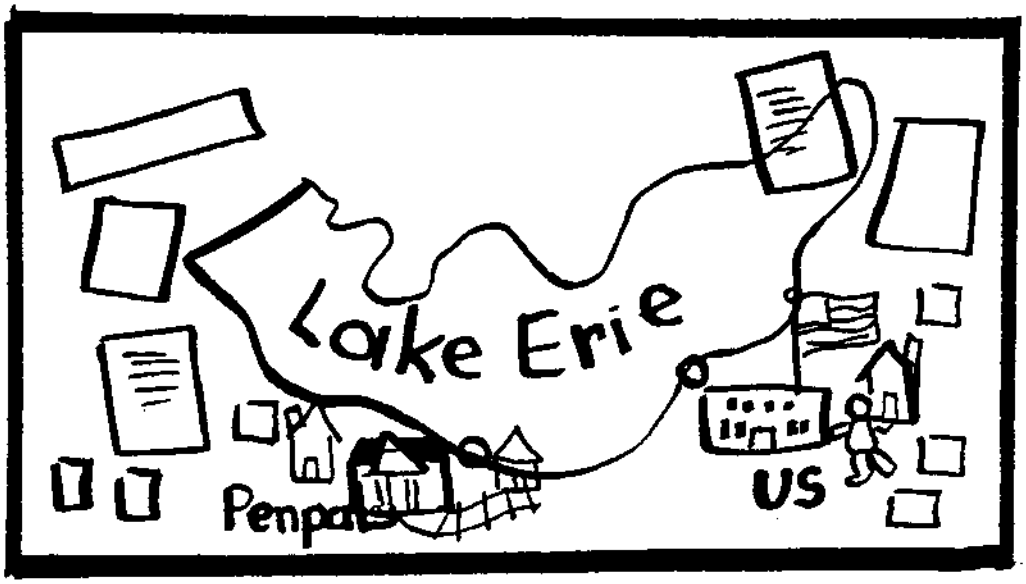
4. Post answers after classroom discussion - then send an identical questionnaire to the "penpal" community classroom to be

answered. When class receives the survey information back, discussion can lead to the answers of the following questions:

A. How are the 2 communities alike?
B. How are they different?
C. Does Lake Erie affect each community in the same way? How?
D. Are there different effects? Name them.
E. Which city has more beach? Is that good? Why?
F. Is the weather different? If so, why?
G. Does Lake Erie provide fun? How?
H. How does lake Erie help each community?
I. How does Lake Erie cause problems for each community?
J. What Lake Erie questions still remain?

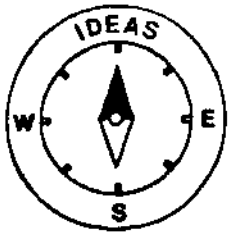
5. Collect any brochures on your hometown, a map of it, a local paper and some photographs for sharing with "penpal" community.

6. Have students create a bulletin board featuring the "penpal" communities.



From my Hometown... Lake Erie to Your Hometown!

1. What does your community look like?
2. What kinds of people live there?
3. How do the people earn money?
4. What is the weather like?
5. In which basin of Lake Erie is your community located?
6. How does your community use the lake?
7. What big businesses are in your town?
8. Are there any Lake Erie businesses?
9. List some advantages of your city.
10. List some disadvantages.
11. What are the homes on Lake Erie like?
12. Is your part of Lake Erie polluted?
13. What is the chief kind of rock in your city?
14. Is Lake Erie important to your town? Why?



IDEA GUIDE FOR TEACHERS:

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 booklet 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.

POSTCARD WRITING

Another way for your students to internalize a unit is to write postcards to interested people. You can write postcards for several purposes:

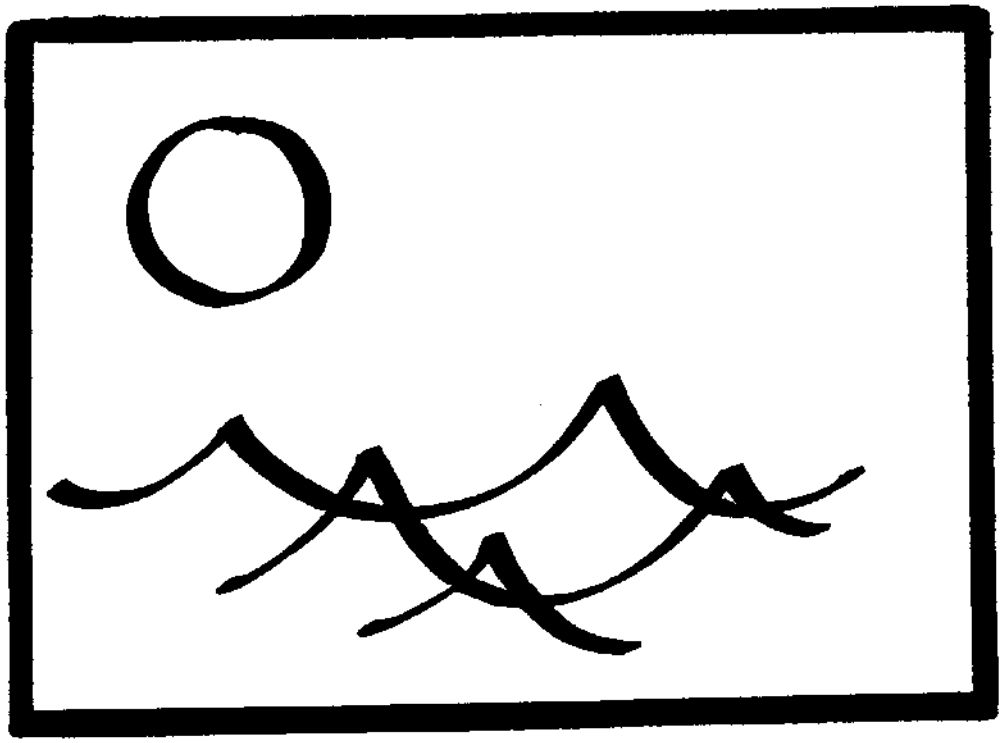
1. to get additional information,
2. to give information,
3. to express concern, or
4. to make a suggestion (We need a new law about...).

look at

Lake Erie

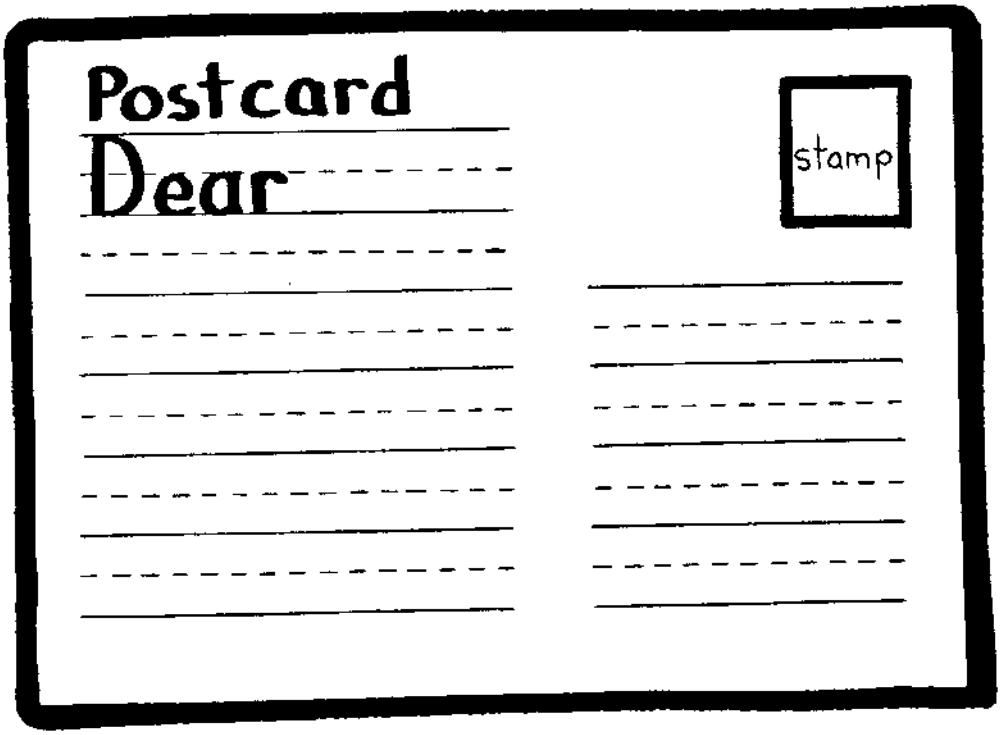
name _____

Design your own Lake postcard...



Add fish, boats or whatever will tell about Lake Erie.

Write your own postcard message!



Postcard Writing Possibilities

1. Ohio Department of Natural Resources
   Fountain Square
   Columbus, Ohio 43224

2. Lake Erie and Ohio Sportfishing, Inc.
   Box 174
   Lakeside, Ohio 43440

3. Great Lakes Fisherman
   P.O. Box 20286
   Columbus, Ohio 43220

4. Ohio Fisherman
   P.O. Box 20096
   Columbus, Ohio 43220

5. Walleye Magazine
   P.O. Box 40210
   Cleveland, Ohio 44140

6. Walleye International
   P.O. Box 40210
   Cleveland, Ohio 44140

7. National Wildlife Federation
   1412 Sixteenth N.W.
   Washington, D.C. 20036

8. Angler's Award
   Office of Information
   Box 1673
   Harrisburg, PA 17105-1673

9. Ohio Sea Grant Program
   Ohio Cooperative Extension Service
   484 W. 12th Avenue
   Columbus, Ohio 43210

10. Ohio Fish Finder
    David Manley
    118 Vine Street
    Clyde, Ohio 43410

11. Ohio Out-of-Doors
    5278 E. 98th Street
    Cleveland, Ohio 44125

Art Activities

1. Lake Erie: ... big mural of its uses

or –

1. Water color the 5 Great Lakes.
2. Potato prints of Lake Erie.
3. Glacier pictures – use mixture of Tide and water... paint with 2 fingers to create glaciers.
4. Water color Lake Erie – THEN use black marker or paper to illustrate a way one can enjoy Lake Erie.

5. Create ships, tankers etc. out of milk cartons or styrofoam.
6. Create dioramas of Lake Erie influencing our weather, recreation etc.

7. Create Lake Erie "Monsters" or designs with printed or cursive writing of Lake Erie on the fold of the paper.

8. Sponge paint the water... add boats, swimmers, fisherpeople, etc.
9. Make Mobiles of Lake Erie uses.

10. Use clay, and finger impressions in it, to form a lake.
11. Create a Lake Erie scene... cover it with a "wash."
12. Draw a Lake Erie scene, but fill it with circles.

13. Draw barges, freighters, or tugs. stuff them and paint both sides.

coast	west
glacier	geologist
ecology	agriculture
erosion	recreation
pollution	conservation
industry	Erie

Iroquois	east
north	basin
south	

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.....Life
In a Running Brook.....Lubell, Winifred
The Fishes.....Ommanney, 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 Stange 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
Chane and Time.....Podendorf,Illa
The Wump World.....Peet, Bill

Ecology

Ecology - The Circle of Life.....Hungerford, Harold

Songs About Bodies of Water, Fish, Fishing, Pollution, Ships, Sailing

Song	Composer	Source
All the Fish Are Swimming in The Water	American Folk	MSGO
All the Little Birds (Fish)	French Folk	SBM-K
Allee Alee O, The	American Folk	DMT-EC
At the Harbor	McLaughlin	SaS
Bell Buoy	Wood	MSF
Billowing Sails	Wood	MSF
Buying Fish	Yiddish Folk	SBM-III
Canoe Song	American Indian	EM-III
Cargo Workers	Sea Chantey	SBM-III
Come Boating With Me	Italian Folk	EM-III
Crowded Hole, The	American Folk	SGO
Don't Go Near the Water	American Folk	MYA-III
El barco chiquitito (The Little Boat)	Mexican Folk	MYA-III
Faithful Lighthouse	Wood	MSF
Ferry Boat	Buttolph	MIM
Ferryboat	Schubert	MSF
Ferryboat Is Coming	Wood	MSF
Fishpole Song	Southern Singing Game	SBM-II
Floating Down the River	Singing Game	SBM-K
Flounder, The	Broudy	D
Fog, The	Smith	MYA-III
Fog Horn, The	Haynie	EM-I
Freddy the Frog	Wright	TT
Frog, The	Broudy	D

Song	Composer	Source
Frog and the Mouse, The	American Folk	SGO
Frog in the Well, The	Appalachian	SBM-III
Frog Song, The	Traditional	SBM-II
Frog Went a-Courtin'	Virginia	AFSC
Haul on the Bowline	Sea Chantey	SBM-III
I Saw Three Ships	English Carol	EM-III
I Want To Go To the Beach This Summer	Wright	TT
I'd Like To Be a Lighthouse	Frankenpohl	EM-I
Imagination of Grand Sea	Japanese Folk	SBM-III
Jackfish, The	Appalachian	SBM-I
Land of the Silver Birch	Canadian Folk	EM-III
Let's Build a Boat	O'Leary	ADLS
Let's Go to the Sea	Guatemala Folk	SBM-I
Little Mister Polliwog	Wilkins	NDM-K
Little White Duck	Zaritsy	EM-I
Lonely Little Sailboat	Wood	MSF
Michael, Row Your Boat	American Folk	EM-III
My Boat	Hawaiian Folk	TIM-3
On, Roll On (En Roulant Ma Boule)	French Folk	MSGO
Over the Deep Blue Sea	Traditional	MSF
Picture a World	Riposo	SSS
Roll, Wave, Roll	O'Leary	ADLS
Row, Row, Row Your Boat	Traditional Round	EM-III
Sailboats	Buttolph	MIM
Sailing	Marks	MYA-III
Sailing Song	Sea Chantey	SaS

Song	Composer	Source
Seashell, The	Wood	SaS
Seashore	Traditional	MSF
Ship A-Sailing	English Folk	EM-III
Ships	Buttolph	MIM
Shore	Miller	NDM-K
Six Little Ducks	American Folk	EM-I
Stop the Poison	Donough	SCS
Ten Little Frogs	Pavelko	SF
There Was An Old Fish	American Folk	MSGO
Tug Boat	Buttolph	MIM
Voyageur, Le (The Voyager)	Canadian Folk	LM
Water Wheel, The	Japanese Game Song	SBM-II

Key To Books

ADLS	All Day Long Songs. Shawnee Press, Inc.
AFSC	American Folk Songs for Children. Ruth Crawford Seeger. Doubleday & Co.
BMS-2	Birchard Music Series - Book Two. Summy-Birchard Co.
BMS-3	Birchard Music Series - Book Three. Summy-Birchard Co.
D	Discovery! M. Whitmark & Sons.
DMT-EC	Discovering Music Together - Early Childhood. Follett Publishing Co.
EM-I	Exploring Music I. Holt, Rinehart & Winston.
EM-III	Exploring Music III. Holt, Rinehart & Winston.
LM	Literature and Music. Tooze and Krone. Prentice-Hall, Inc.
MIM	Music Is Motion. Edna Buttolph. Willis Music Co.
MSF	More Singing Fun. McGraw-Hill Book Co.
MSGO	More Songs to Grow On. Edw. B. Marks Music Corp. Beatrice Landeck.
MYA-III	More for Young Americans - III. American Book Company.
NDM-K	New Dimensions in Music - Kindergarten. American Book Company.
SSS	Sesame Street Songbook. Warner Bros. Publishing Co.
SCS	Sierra Club Songbook. World Around Songs.
SaS	Sing a Song. Roberta McLaughlin & Lucille Wood. Prentice-Hall, Inc.
SBM-K	Silver Burdett Music - Kindergarten Book. Silver Burdett Co.
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.
SF	Singing Fun. McGraw-Hill Book Co.
SGO	Songs to Grow On. Beatrice Landeck. Edw. B. Marks Music Corp.
TIM-3	This Is Music - 3rd Grade Book. Allyn & Bacon.
TT	Tickle Tunes-Songs for Little People. Choristers Guild.

RECORDS FOR RHYTHMIC ACTIVITIES

RECORD	COMPOSER
Barcarolle	Rubenstein
Boating on the Lake	Kullack
Boat Rhythms (Creative Rhythms)	Phoebe James
- Rowboat - Sailboat - Tugs and Liners	
Dance-a-Story	Barlin
- At the Beach - Little Duck	
En Bateau (In a Boat)	Debussy
To a Water Lily	MacDowell

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

RECORDS FOR LISTENING

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

Records available in LRC in most schools

A POSTER FOR YOUR BULLETIN BOARD

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

Lakes...

The Great

Ohio Sea Grant Program

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