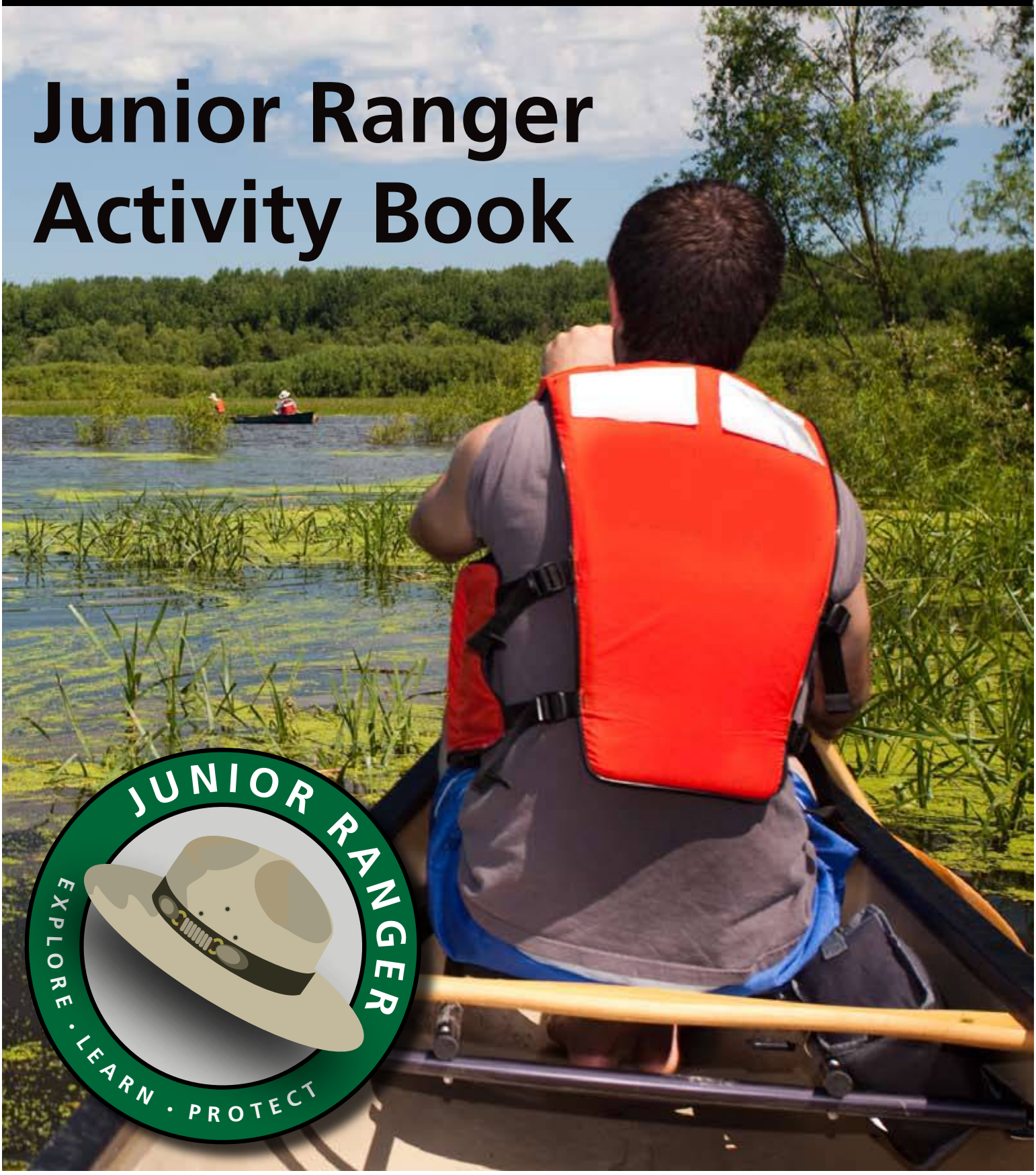
# Great Lakes

National Park Service
U.S. Department of the Interior

National Parks of the Great Lakes
Great Lakes Restoration Initiative

# Junior Ranger Activity Book



# The National Park Service

Established in 1916, the National Park Service preserves and protects the natural and cultural resources and values for the enjoyment, education, and inspiration of this and future generations.

Today, there are 15 national parks located on or near the Great Lakes.

Park rangers are the individuals who make sure those places are preserved and protected.  Junior Rangers can help!

To become a Great Lakes Junior Ranger,
you must explore, protect,
and learn about the Great Lakes.

To earn your Junior Ranger Badge
Age 6-9: complete 6 activities
Age 10 and up: complete all activities

**Look for the Junior Ranger icon for more opportunities to explore, learn, and protect.**

# Protecting the Great Lakes

The people that preserve and protect the National Parks are called park rangers. They have many different kinds of jobs and wear many different kinds of hats. Some protect resources, some lead hikes, and some do research. You may see them out in the park exploring, learning, and protecting. Many do activities that Junior Rangers can participate in too.

**Grab your gear and join them out in the park today!**

Circle what you should take with you for a day out in the park with a ranger.


Video Game

Sunscreen

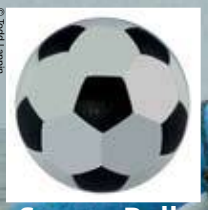
Loud Music

Healthy Snack

Hat

Sun Glasses

Binoculars



Soccer Ball

Camera

Water

**Ask a park ranger about how they protect the park.**

# A Walk Through the Woods

Take a hike through this forest trail word maze. This word search winds back and forth down a forest trail. Explore the woods by circling words you discover.

Trail starts here

T R E E L E A V E S R O

S S O M E K A N S S K C

D E E R P I N E C O N E

B A R N A C P O P L W O

B I T F O O T P R I N T

U G R E W O L F D L I W

M W R A P P E R B I R D

Exit the woods here

What should you do with trash on the trail?

_____

What animal could you have seen, if you entered from the lower end of the trail? _____

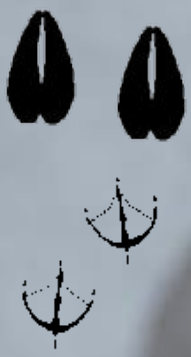
**Hike on a trail through the woods in your closest park. Explore the trail for footprints and other signs of wildlife along the way.**

# Whose Tracks Are Those?

National Parks are special places where plants and animals are protected. The lakes, forests, wetlands, and fields in the Great Lakes region are home to many species of wildlife.

Can you match the animal with the tracks it made?


mallard





beaver


white-tailed deer


bald eagle


herring gull


snapping turtle

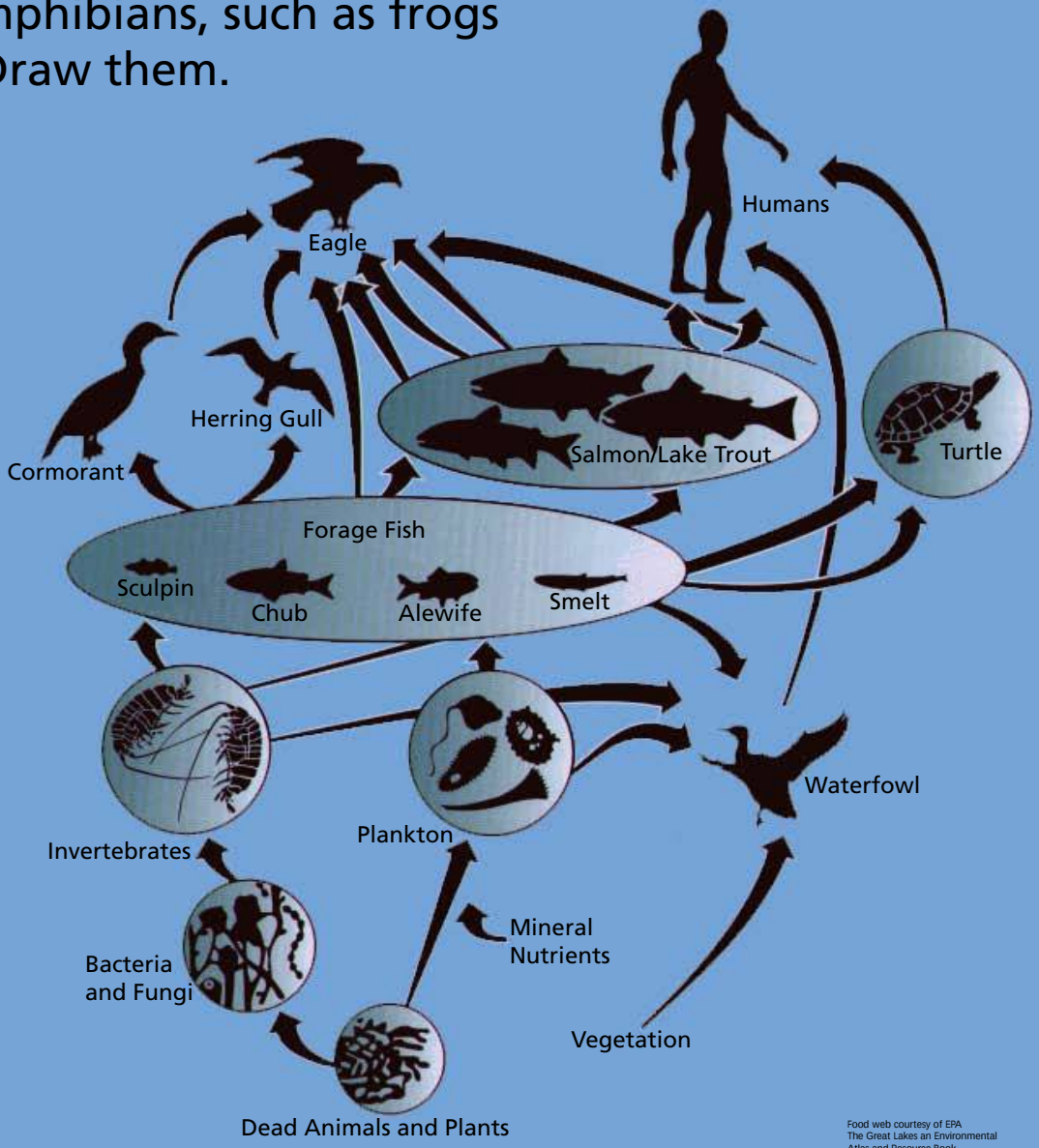
**How many of these tracks you can find in the park?**

# Making the Connection

Much like the neighborhoods where you live, ecosystems are communities of plants, micro-organisims like bacteria, and animals that depend on each other and their environment.

Humans and eagles _____ salmon and lake trout.
*eat* or *are eaten by*

Where would amphibians, such as frogs fit in this web? Draw them.



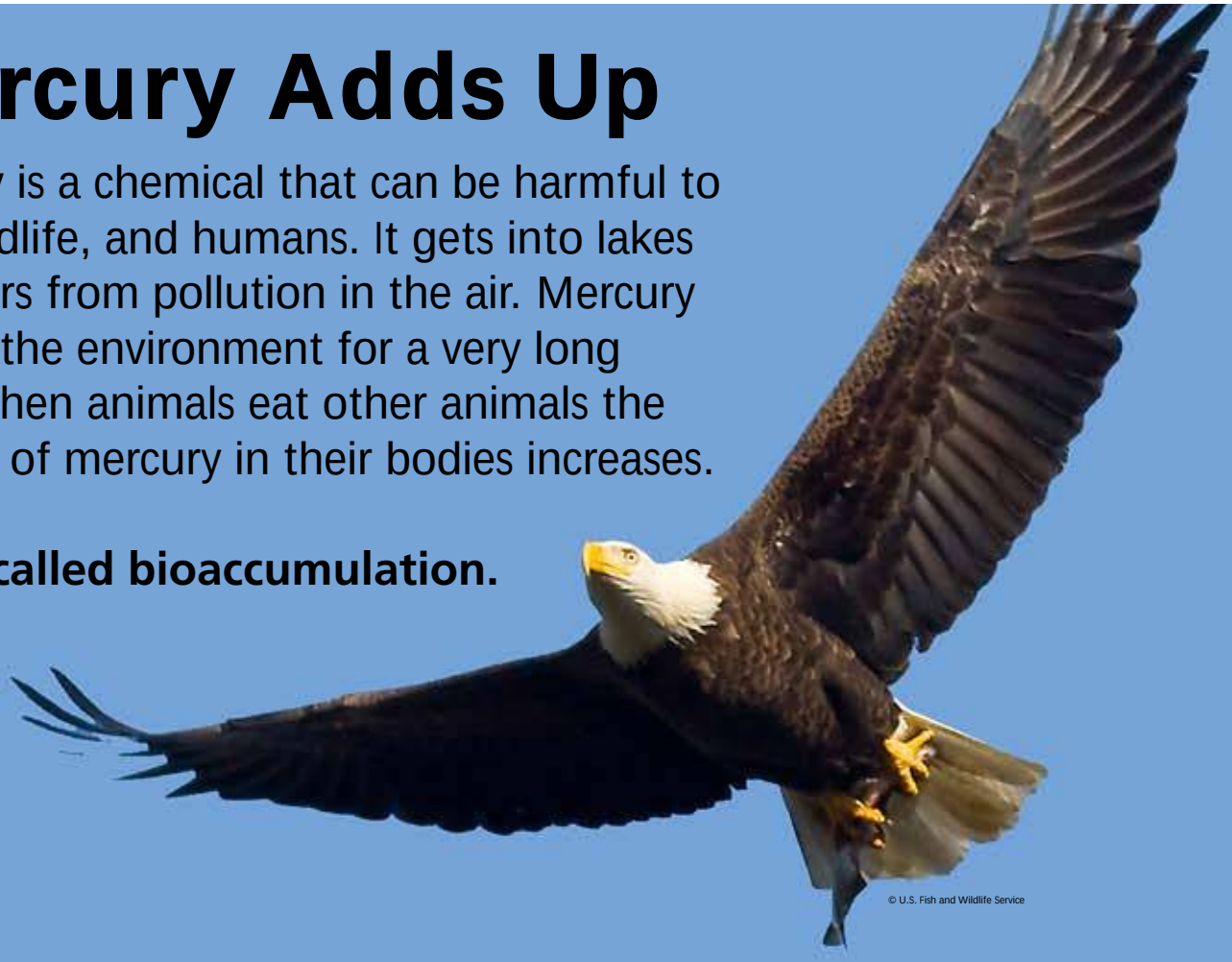

Food web courtesy of EPA
The Great Lakes an Environmental Atlas and Resource Book

**If there were no plankton or invertebrates what might happen to the eagle population?**

# Mercury Adds Up

Mercury is a chemical that can be harmful to fish, wildlife, and humans. It gets into lakes and rivers from pollution in the air. Mercury stays in the environment for a very long time. When animals eat other animals the amount of mercury in their bodies increases.

**This is called bioaccumulation.**




If all the small fish in a lake get 10 parts of mercury from the water they live in, and a larger fish eats 100 of these small fish, how many parts of mercury could the larger fish end up with?

---

Bald eagles eat lots of fish. If an eagle ate 20 of the smaller fish and 20 of the larger fish, how many parts of mercury might it end up with?

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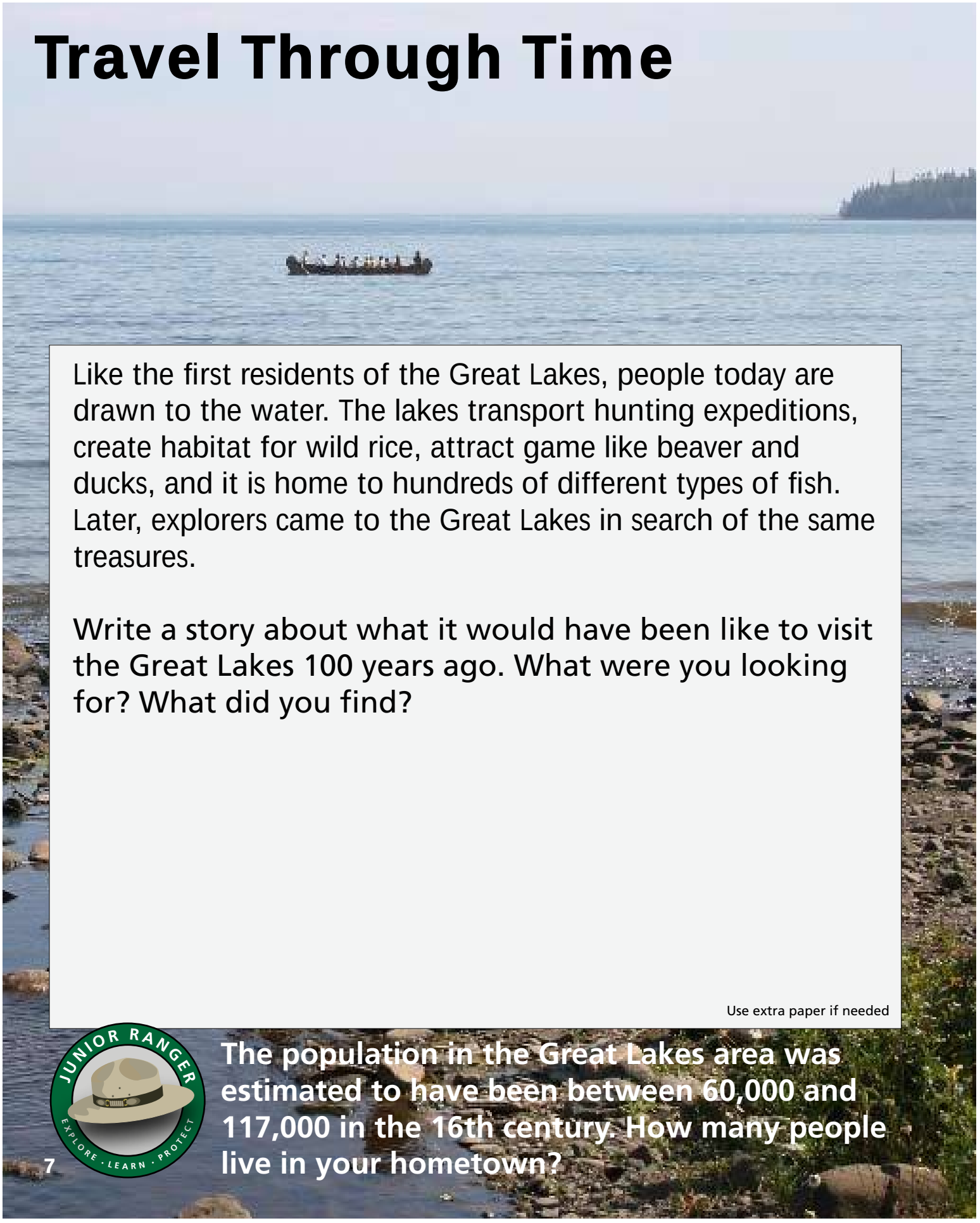
**Electronics, fluorescent bulbs, and batteries contain mercury. Help protect bald eagles by properly recycling these items.**

# Travel Through Time



Like the first residents of the Great Lakes, people today are drawn to the water. The lakes transport hunting expeditions, create habitat for wild rice, attract game like beaver and ducks, and it is home to hundreds of different types of fish. Later, explorers came to the Great Lakes in search of the same treasures.

Write a story about what it would have been like to visit the Great Lakes 100 years ago. What were you looking for? What did you find?

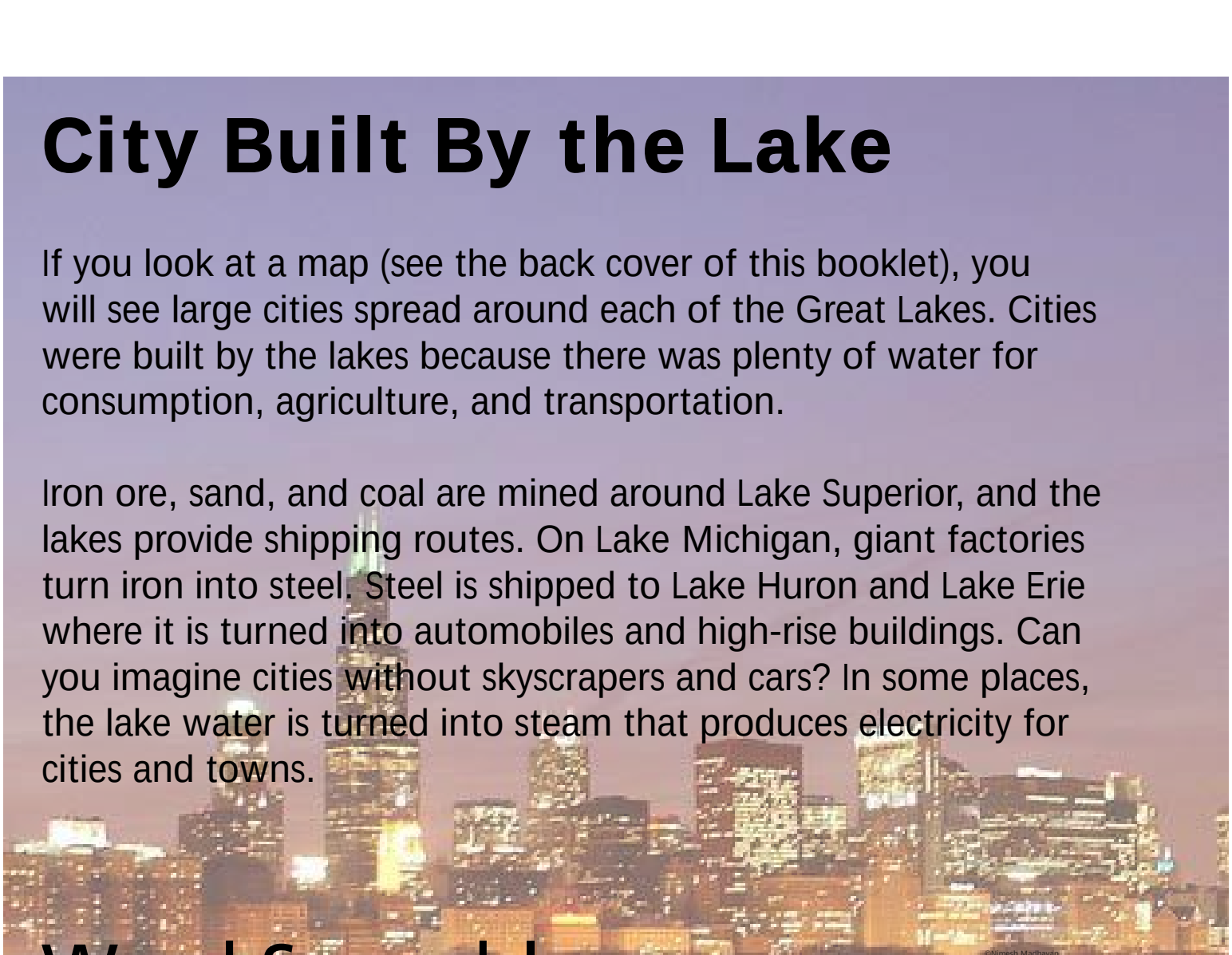
Use extra paper if needed

**The population in the Great Lakes area was estimated to have been between 60,000 and 117,000 in the 16th century. How many people live in your hometown?**

# City Built By the Lake

If you look at a map (see the back cover of this booklet), you will see large cities spread around each of the Great Lakes. Cities were built by the lakes because there was plenty of water for consumption, agriculture, and transportation.

Iron ore, sand, and coal are mined around Lake Superior, and the lakes provide shipping routes. On Lake Michigan, giant factories turn iron into steel. Steel is shipped to Lake Huron and Lake Erie where it is turned into automobiles and high-rise buildings. Can you imagine cities without skyscrapers and cars? In some places, the lake water is turned into steam that produces electricity for cities and towns.




## Word Scramble

Unscramble these words to reveal how people make a living on the Great Lakes. Hint: think of action words ending in *-ing*.

| | | | |
|---|---|---|---|
| gilgong | rinfgam | hingsif | rayqunirg |
| gipshnip | ningmi | lidbugin | tanufincmugar |

**Over 33,000,000 people call the Great Lakes home. Without the lakes, where would all those people get fresh water to drink?**

# A Superior Value

Lake Superior is the largest of the five Great Lakes. It contains three quadrillion (3,000,000,000,000,000) gallons of water. That's 10% of the world's fresh surface water!

Lake Superior holds over half of the water in the Great Lakes.

A gallon of drinking water costs about $2.00.

If all of Lake Superior was bottled for drinking water, how much would it be worth?

$____,000,000,000,000,000

How many gallons of fresh water exist on the Earth's surface?

____,000,000,000,000,000

How is water valuable to wildlife?

_____

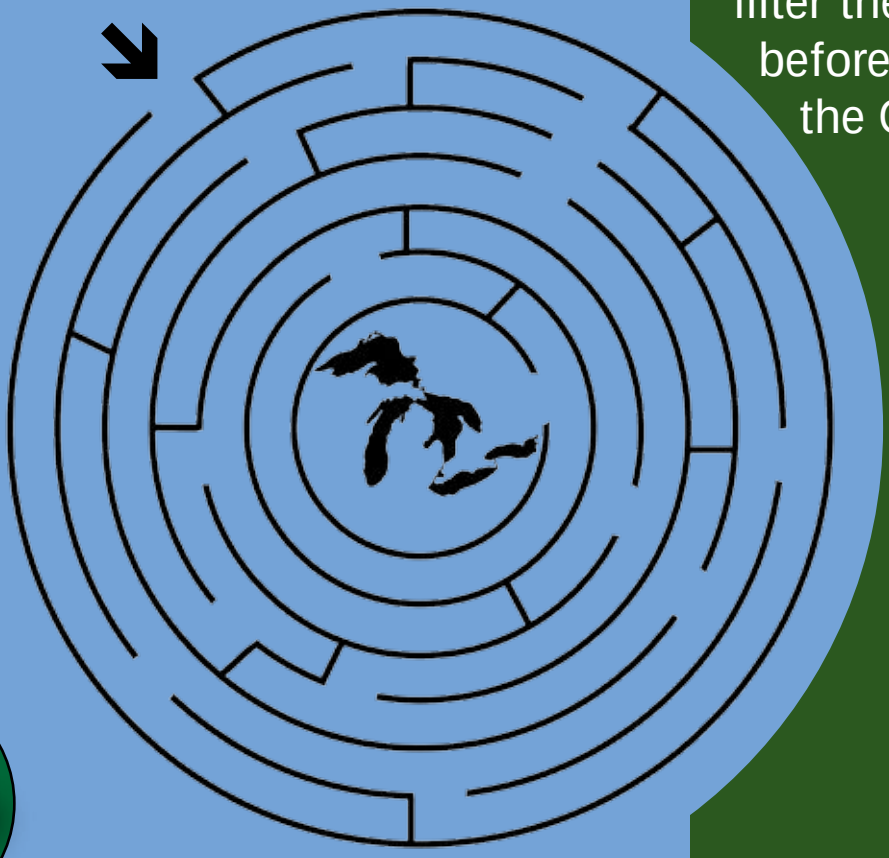
_____

**Are you thirsty? Use a refillable water bottle. Rangers reduce, reuse, and recycle.**

# A-maze-ing Lakes

Approximately 1.8 million gallons of water drain through the Great Lakes every second. Some of that water flows across forests, fields,rivers, and streets. It sometimes picks up garbage and pollutants along the way. Rain gardens are planted with special plants in key places to help filter the water before it reaches the Great Lakes.

Help the rain water navigate the maze, from the rain garden to the Great Lakes.



**How can you conserve water at home?**

# Gone Fishing

Ted and his mom are going to spend a day fishing at a national park. They know that invasive species can be unwanted hitchhikers. These plants and animals cause harm to the places we enjoy.


Hybrid cattail seeds are tiny and stick to anything fuzzy, like pets or pants.


Eurasian water-milfoil tangles around things like boats and trailer parts.


Spiny water fleas stick to nets and fishing gear.


Zebra mussels hide in anything wet, from boats to buckets.



Where should they check to make sure each of these invaders doesn't make the trip with them? Draw a line from the invader to it's hiding location.

**Stop aquatic hitchhikers, practice good clean fun. Check clothing, pets, and equipment for invasive species before you get to the park!**

STOP AQUATIC HITCHHIKERS!™

# Healthy Habitats

Balloons

The Great Lakes and the rivers and streams connected to them contain many wonderful things including animals, rocks, clean water, and even people having fun. However, sometimes other things get into the water and cause problems for wildlife, the water itself, and even humans!

Circle the items that are part of a healthy Great Lake.

*A pet fish*

*Someone like you*

Paint and chemicals

Lake perch

**What items have you seen on the beach or shore that don't belong?**

# Lake Bingo

The Great Lakes National Parks hold many natural, cultural, and historical wonders for visitors to explore.

How many of these things can you find during your visit to a national park?

Mark out each item you see. The first three in a row, up, down, or diagonal wins. Play multiple rounds or with friends.

Round 1


Round 2


Round 3

# Guiding Light

There are over 100 lighthouses and harbor lights on the Great Lakes. Have you seen one? What color was it? Color this lighthouse.

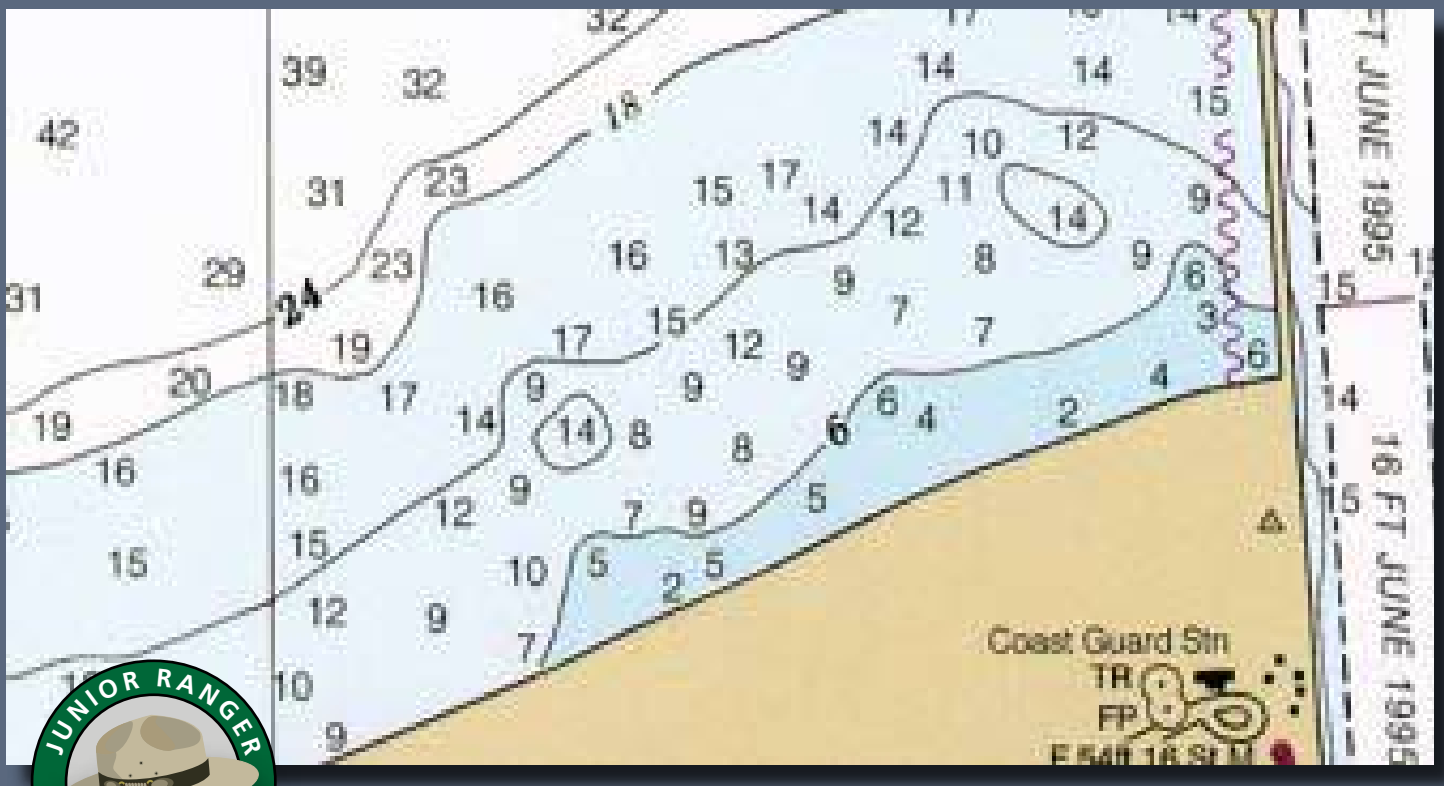
Lighthouses help guide ships into harbors or help them navigate around rocky and shallow passages. Draw a ship on the lake. What kind is it? What is it carrying?


**Many of the lighthouses along the Great Lakes are historic landmarks. The park service protects them as a part of our cultural history.**

# To the Bottom of Things

The measurement of lake depth is called *bathymetry*. Knowing how deep a lake is allows boaters to navigate through shallow water, helps parks plan safe swimming areas, and might even point to a good fishing hole or two. Study the chart below. The numbers and contour lines represent the water depth in feet.

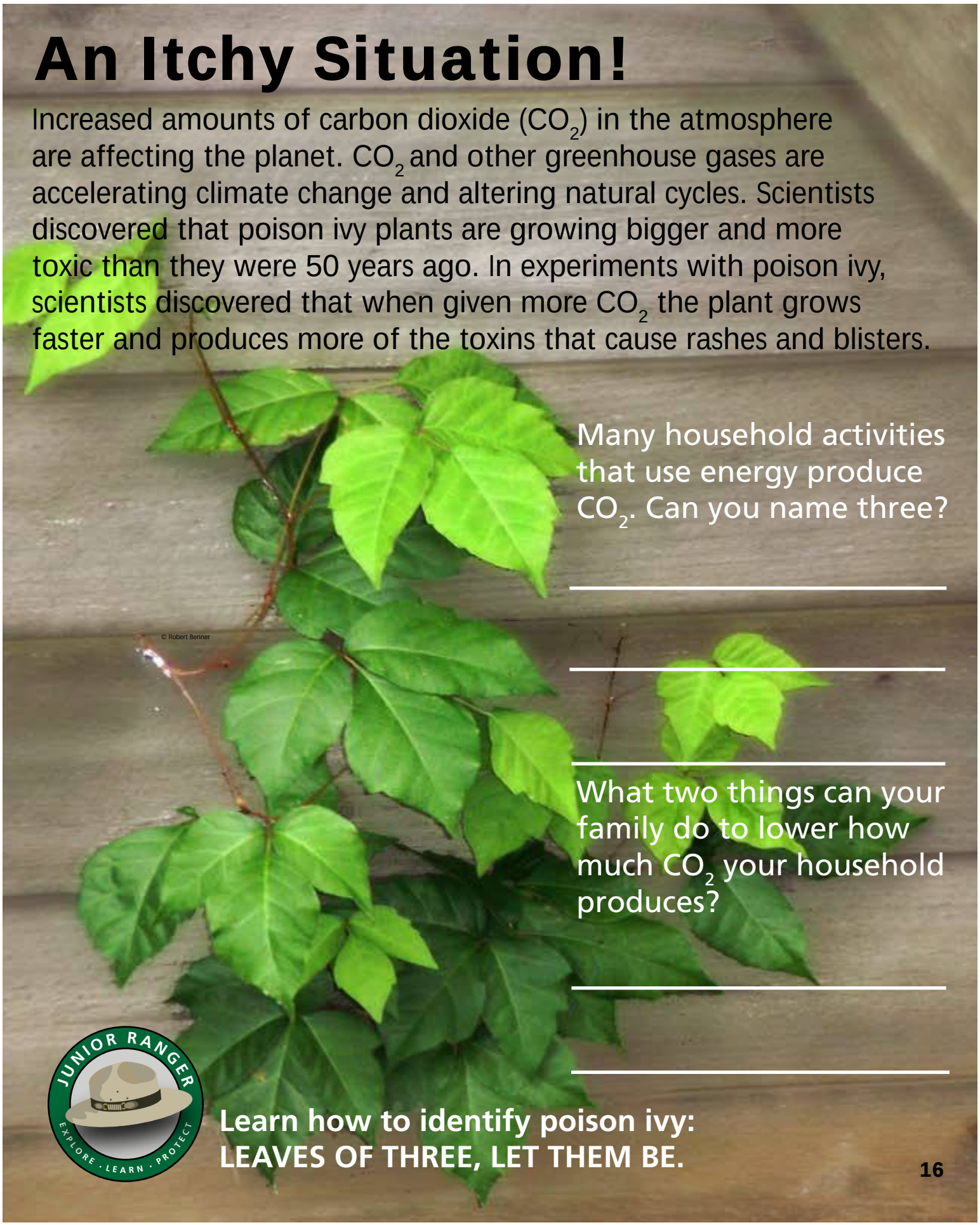
Draw an *umbrella* on the beach area where families can visit. Draw a *boat* on a place next to shore with water over six feet deep. Draw *fish* where you might find them lurking in cool, deep pockets of water.




**How would plants, animals, and people be affected if lake levels changed?**

# An Itchy Situation!

Increased amounts of carbon dioxide ($CO_2$) in the atmosphere are affecting the planet. $CO_2$ and other greenhouse gases are accelerating climate change and altering natural cycles. Scientists discovered that poison ivy plants are growing bigger and more toxic than they were 50 years ago. In experiments with poison ivy, scientists discovered that when given more $CO_2$ the plant grows faster and produces more of the toxins that cause rashes and blisters.




Many household activities that use energy produce $CO_2$. Can you name three?

_____

_____

_____

What two things can your family do to lower how much $CO_2$ your household produces?

_____

_____

**Learn how to identify poison ivy:**
**LEAVES OF THREE, LET THEM BE.**

# Did You Know...?

Within the waters of the Great Lakes there are 150 different types of native fish. The largest of these fish is the Lake Sturgeon, which can grow to over 8 feet (1.8 meters) long.

The deepest point of the Great Lakes is in Lake Superior near Pictured Rocks National Lakeshore, 1,333 feet (406 meters) below the surface! If the Empire State Building were built there, only the antenna tower would stick out above the water.

The Great Lakes have 10,210 miles (17,017 km) of shoreline, (including islands). To kayak along the entire shore would be like kayaking from Los Angeles, California, across the Pacific Ocean to Tokyo, Japan, and back.

The Great Lakes were partially formed from the melting ice when glaciers retreated.  The lakes continue to change and evolve



# Activity Solutions

Walk Through the woods
tree leaves, rocks, snake, moss, deer, pinecone, owl, pop can, rabbit, footprint, wildflower, gum wrapper, bird
carry it out, dispose of it properly
wolf

City Built by the Lake
logging, farming, fishing, quarrying, shipping, mining, building, manufacturing

A Superior Value
$6,000,000,000,000,000
30,000,000,000,000,000
as habitat and homes

Mercury Adds Up
1,000
20,200

A-maz-ing Lake

Healthy Habitats
you belong in the lake
(but only when its safe to swim),
lake perch

Making the Connection
Eagles and humans eat salmon and lake trout
Frogs fit above invertebrates and many things eat them

# Great Lakes Junior Ranger

# Certificate of Completion

*Presented to:*

_____

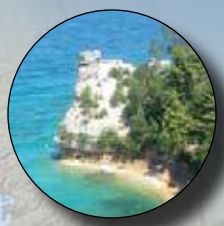
Junior Ranger

_____

Issuing Park Ranger Date

stamped by issuing park

# Explore all the **Great Lakes National Parks**





For more information about national parks visit:
http://www.nps.gov

For more Junior Ranger fun, go to:
http://www.nps.gov/webrangers/

Great Lakes RESTORATION

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