

Acknowledgements

This Activity Book was updated and revised by Park Ranger Justen Walker in collaboration with other U.S. Army Corps of Engineers Park Rangers. This update of the thirty-year-old original has new themes, graphics, text and layouts that were created in order to broaden the audience of the book. Hermie, the hermit crab, was created and illustrated by Justen Walker.

The original Activity Book, upon which this is based, was created in 1982 through a cooperative effort between Bridgewater State College Elementary Education Department and the U.S. Army Corps of Engineers Cape Cod Canal Field Office for use in the Cape Cod Canal Educational Outreach Program. The authors and illustrators, Sheila Smith and Lynn Townsend, were Elementary Education Majors from the college.





For more on the Cape Cod Canal,
please visit us on the web at
http://www.corpslakes.us/capecodcanal
or call
The Cape Cod Canal Visitor Center 508-833-9678
The Cape Cod Canal Field Office 508-759-4431

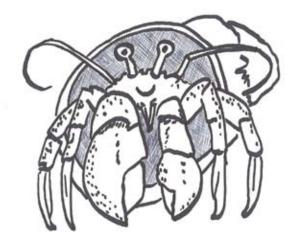


Hello Boys and Girls!

You may have biked, boated, walked, or fished along the Cape Cod Canal. But, do you know why the canal is here? How it was built? Or what kind of ships go through it?

These are only a few of the many questions that this activity book will help you answer. You will soon discover that the Cape Cod Canal is a unique and interesting area to visit.

The U.S. Army Corps of Engineers welcomes you to the Cape Cod Canal!



This is Hermie the hermit crab. He will guide you through the Activity Book and provide you with some fun facts about the Cape Cod Canal.



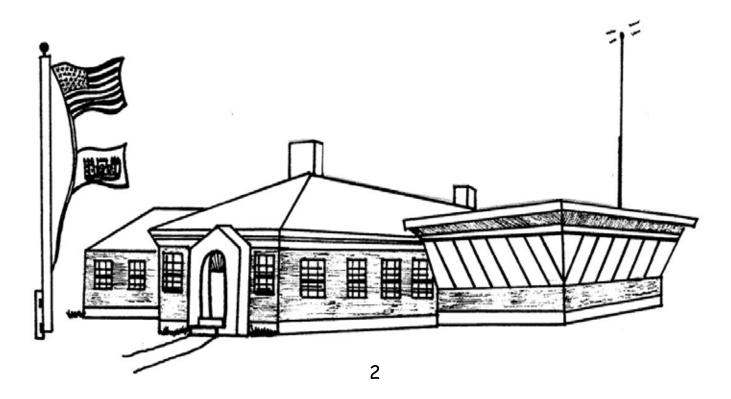
The U.S. Army Corps of Engineers

The US Army Corps of Engineers (USACE) is responsible for the operation and maintenance of the Cape Cod Canal. The USACE maintains many navigable waterways throughout the country. These waterways are used like highways to help move people and products around in a safe and economical way.

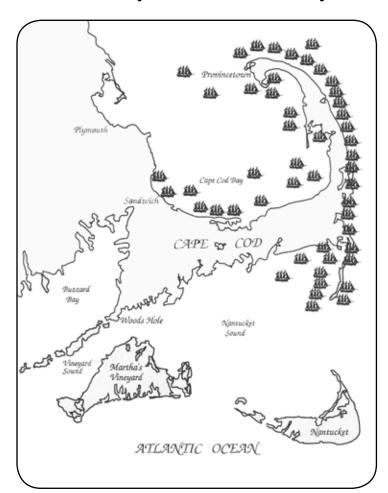
The Cape Cod Canal Headquarters is located on the north (mainland) side of the Canal in Buzzards Bay. At the headquarters, there is a marine traffic control center, a boat basin for USACE boats, a ranger station, workshops, garages, offices, and a marine railway.

The Cape Cod Canal Visitor Center is located on the south (Cape) side of the Canal in Sandwich. Here, visitors can explore the history, operation and unique features of the Canal through hands-on exhibits, films and fun programs.

The District Commander of the New England District USACE and the Canal Manager supervise the entire operation at the Canal. Under the direct supervision of the Canal Manager, there are many trained and experienced people who operate and maintain the Cape Cod Canal.

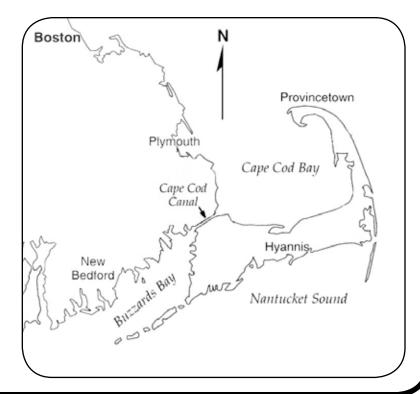


Why the Cape Cod Canal?



For years the outer shores of Cape Cod were known to be dangerous for many ships. Shipwrecks were a common occurrence, with approximately one wreck every two weeks during the late 1800s. How many wrecks are shown on this map?

The Cape Cod Canal allows vessels to avoid the outer shores of Cape Cod. Vessels using the Cape Cod Canal save 65 to 166 miles depending on the routes they travel. The short-cut through the Canal saves people time and money.



Marine Traffic Control



The Cape Cod Canal is a toll free waterway. It is open to traffic 24 hours a day, 7 days a week and 365 days a year. Marine traffic controllers monitor the entire 17.4 miles of the Canal to ensure safe movement of vessel traffic.

A computerized vessel tracking system is used to manage vessel traffic. The system consists of an Automatic Identification System known as AIS, radar, closed circuit television cameras, computers, microwave and multi-channel VHF-FM radio communications.

All types of vessels use the Canal. However, only vessels that have adequate power and are seaworthy are allowed to go through the Canal. The vessels must also be a size that will allow them to pass safely within the limits of the Canal's depth and width, and clearance under the Canal's bridges. Any vessel 65 feet or longer has to call the marine traffic controller to ask permission to pass before entering the Canal.

Canal patrol boats maintain a constant watch along the waterway. The patrol boats assist smaller boats in danger, enforce speed regulations, and remove floating debris from the Canal and its approach channels. Patrol boats can respond quickly to any marine emergency that occurs.

It takes a lot of people to run the Cape Cod Canal...

In addition to the Marine Traffic Controllers and the boat crews, there are many others who help maintain and operate the Cape Cod Canal. Park Rangers patrol USACE lands along the Canal, protect natural and cultural resources, and offer many public education programs at the Canal Visitor Center and other areas along the Canal. Park attendants and volunteers greet visitors and assist with the daily upkeep of recreation areas. There are also administrative staff, electricians, engineers, maintenance staff and others who you may not see as much. Everyone is equally important in maintaining and operating the Cape Cod Canal.



Park Ranger leading Junior Rangers on a tree identification hike.



Engineer inspecting the Sagamore Bridge



Electricians replacing lights



Park attendant keeping the Canal's recreation areas clean.



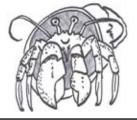
Boat operator patrolling the Canal.

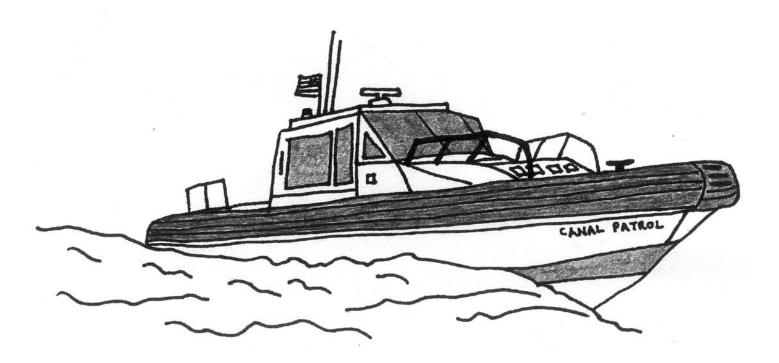
While visiting the Cape Cod Canal, try to find the names of the following people:

| Park Ranger | |
|-------------------|-----------|
| Marine Traffic Co | ontroller |
| Boat Operator | |
| Engineer | |
| Park Attendant . | |
| Volunteer | |

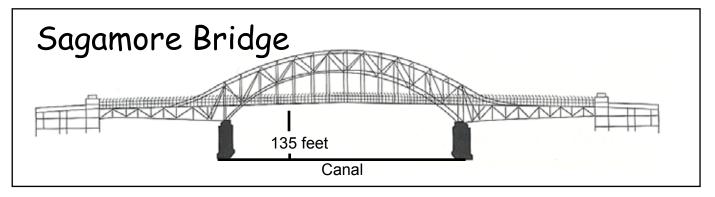
Hermie's fun fact:

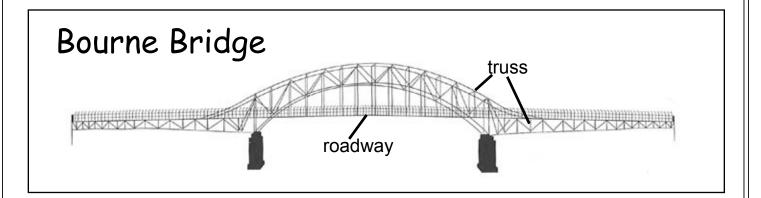
All of the people at the Cape Cod Canal work for the U.S. Army Corps of Engineers, but only a few are actually engineers and or in the military!





Highway Bridges





There are two continuous truss highway bridges that cross the Canal. The truss is the framework of steel beams that form the arch and approach. The roadway is suspended by cables attached to the truss. The Sagamore Bridge is near the Canal's east end closer to Cape Cod Bay. The Bourne Bridge is near the Canal's west end closer to Buzzards Bay.

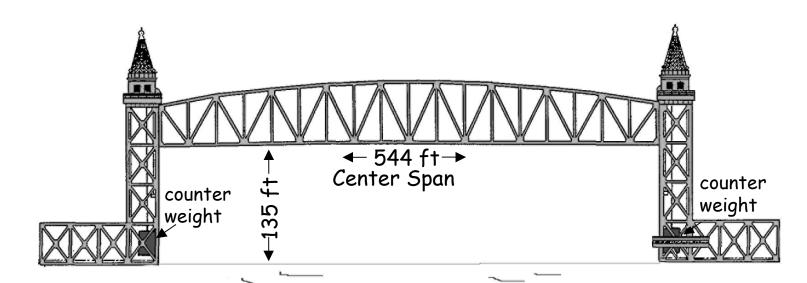
They look almost identical, but the Bourne Bridge is longer. It is 2,384 feet long, while the Sagamore Bridge is only 1,408 feet long. The bridges are suspended 135 feet above the waterway, so many large ships can pass under them.

The bridges were built during the years 1933-1935. This was the time of the Great Depression and many people needed jobs. The government provided money to employ about 700 people to construct the Canal's bridges.

Railroad Bridge

How many words can you find in the words "Railroad Bridge"?

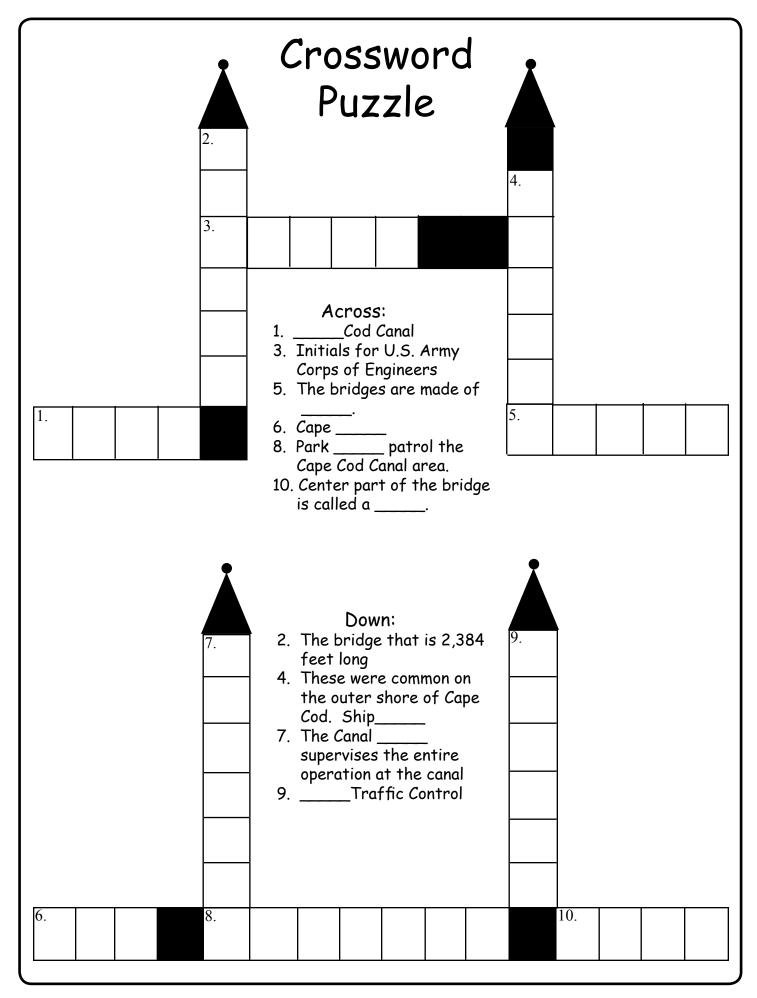
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Hermie's fun facts about the railroad bridge:

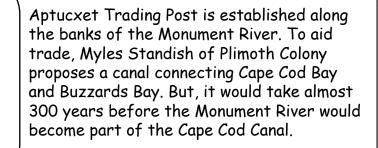
- The original cost to build the bridge in 1935 was \$1,560,000
- It takes 2.5 minutes to raise or lower the center span of the bridge.
- Counter weights hang within the towers on each side of the bridge. They each weigh 1,100 tons. Added together they weigh the same as the center span: 2,200 tons. That's about the same weight as 365 school buses!
- When the span is lowered the counterweights rise. When the span rises the counterweights are lowered.





Cape Cod Canal History Timeline Draw a picture of the event in the box provided or

color the picture there.



1602

Cape Cod is discovered by Bartholomew Gosnold. 1627

1883

1620

17.76

Arrival of the Pilgrims in Plymouth.

During the Revolutionary War, British warships pose a threat to ships voyaging around the outer shores of Cape Cod. General George Washington orders Thomas Machin to survey the canal route, believing that the canal would "Give greater security to navigation and against the enemy."

Frederick Lockwood attempts to build a canal using a specialized machine he built called a dredge. Dredges are large machines that dig, scoop or suck material from the bottom of a waterway. Lockwood's dredge broke down a lot. He dug out 1 mile of the Canal before he had to give up.



Hermie's fun fact:

William Barclay Parsons was the chief engineer for the Cape Cod Canal. But, did you know that before the Canal, he was also involved in the construction of the Panama Canal and New York's subway system?





June 22nd, construction of the Cape Cod Canal begins when August Belmont Jr. ceremoniously digs the first shovel of dirt, promising "not to desert the task until the last shovelful has been dug." He provided the financial support for the project.

1890s

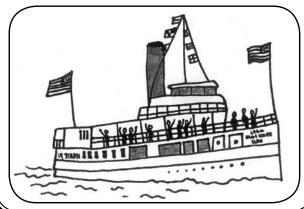
1909

Cape Cod's outer shores are claiming an average of one shipwreck every two weeks. As more cargo, ships, and lives were lost, pressure to build a canal grows.

1928

1914 March 31st, the Federal Government purchases the Canal and places the U.S. Army Corps of Engineers in charge.

July 29th, the S.S. Rose Standish is the first passenger ship to officially pass through the Cape Cod Canal as part of the Canal's grand opening celebration. The Canal is privately operated as a toll waterway with a depth of only 15 feet.



U.S. Government Purchased the Canal...



Belmont had a difficult time making his Cape Cod Canal safe. He had problems with swift currents, erosion, sharp turns and a narrow channel. This led to accidents and Canal closures. He was losing money because fewer vessels were using his Canal.

On March 31, 1928 the U.S. Army Corps of Engineers took over the failing Cape Cod Canal. The USACE knew that the Canal needed improvements to make the Canal a safe waterway that vessels would use.

The World's Widest Sea-Level Canal of its Time was Constructed...

The Canal becomes deeper and wider....

The modern day Cape Cod Canal is 32 feet deep and 500 feet wide. Belmont's Canal was only 15-20 feet deep and 100 feet wide.

Two new highway bridges and one new railroad bridge were constructed....

Belmont had drawbridges, so if a boat was transiting, cars would have to wait.

Sharp turns in the Buzzards Bay approach channel were straightened....
The Canal was extended to 17.4 miles long from Belmont's 13-mile Canal.

Rip-rap (rocks) were placed along the sides of the Canal....

These rocks prevent vessel wakes (waves) from eroding the sides of the Canal.

Better navigational lighting was installed along both sides of the Canal....

The lights make it easier and safer for boats to travel when there is low visibilitiy.

Mooring basins provide vessels a protected place to tie up...

The mooring basins are located on both ends of the Canal.

The Sandwich Marina and a channel into Onset Bay provide a protected area for smaller vessles when needed.

Hermie's fun fact:

The US Army Corps of Engineers' logo is the castle, but why?



Though original documents about the logo were destroyed in a fire, it is believed to represent some of the Corps' very important early construction work. In the early 1800s the Corps built many fort-like structures along the Atlantic Coast to protect our young country. Many of the forts looked like castles.



The Canal Story Word Search

В N T GB R Y K M W S TS E Τ E R R A X Y F A H P T O T S Z Z S N O E Α F F U O O R R E R Y E N S B E A E 0 S P S H E I B N \mathbf{O} Α Α \mathbf{O} P E R Α E N Α R N D R S S N D R U B R U B O U Α O S S K H R P R E ()N R B E Α GE B R F S L D G R P R Α P B Α Α P E Α Α R Α E X \mathbf{G} S R E N E R E \mathbf{O} G Α T Y G Z В R Α E S R H P E H B Α Y W E S W R G P H

Look across, down, diagonally, forwards and backwards to find the following canal terms.

| APTUCXET | \mathcal{C} |
|--------------|---------------|
| BELMONT | 0 |
| BOURNE | E |
| BRIDGE | Р |
| BUZZARDS BAY | P : |
| CANAL | R |
| CAPE COD BAY | R |

CURRENTS DREDGE EROSION PARSONS PILGRIM RAILROAD RIP RAP

SAFE
SAGAMORE
SHIPWRECK
USACE
VESSEL
WASHINGTON

Marjorie Bassett was a resident of the Cape Cod Canal area during the time Belmont owned the Canal. She loved to see the famous New York passenger boat. It traveled through the Canal often. A popular postcard from Cape Cod had the poem that Marjorie Bassett wrote.

The New York Boat

Have you ever been down by the Cape Cod Canal
When the New York boat went through?
Of all the sights I love so well
That one is ever new.

It's fun to ride along a while

Then to stop by the bank to wait.

It's fun to watch the folks arrive

Some early and some late.

Now if you've never been there
To see that boat go by,
You've missed a sight beyond compare,
I'm going to tell you why.

At dusk the old Cape Cod Canal Takes on a glamorous hue And 'tis a glorious spot at which to dwell While the New York boat goes through.



Marjorie Bassett wrote about the way the Cape Cod

Canal made her feel. How does the Canal

make you feel? Create your own poem.

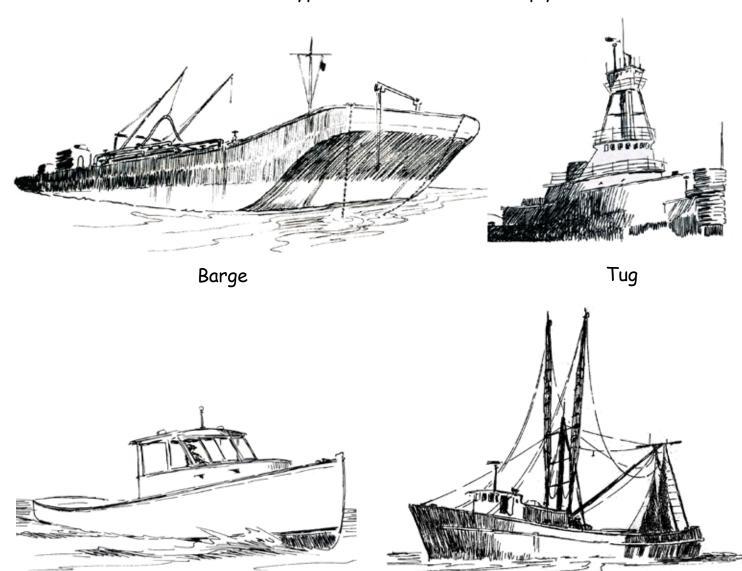
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Ships in the Canal

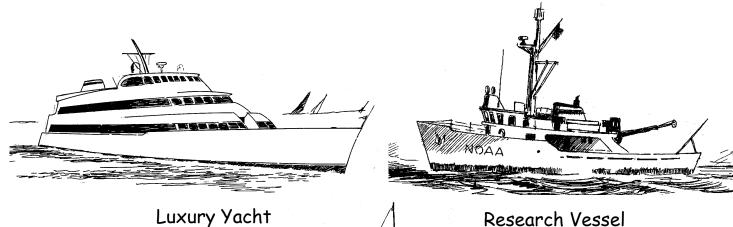
There are many different types of ships that you might see going through the Cape Cod Canal. Some of the ships include the following: huge tankers, tugboats with barges, tour boats, patrol boats, fishing boats and even some tall ships such as schooners, ketchs, yawls and sloops.

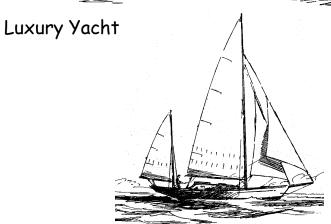
While you are at the Cape Cod Canal see how many different types of ships transit the Canal. Some of the types are drawn here to help you name them.



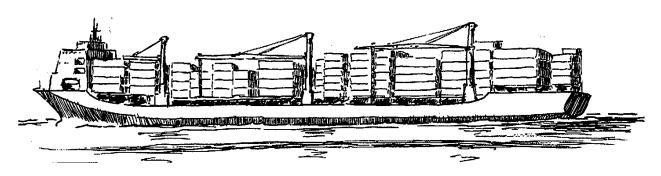
Lobster boat

Trawler (fishing boat)

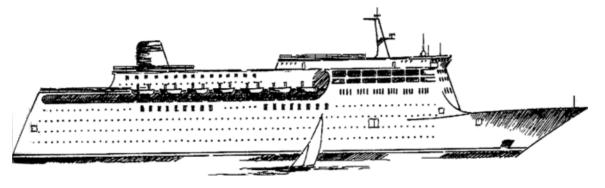




Sailboat -Yawl



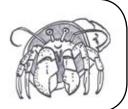
Container Vessel



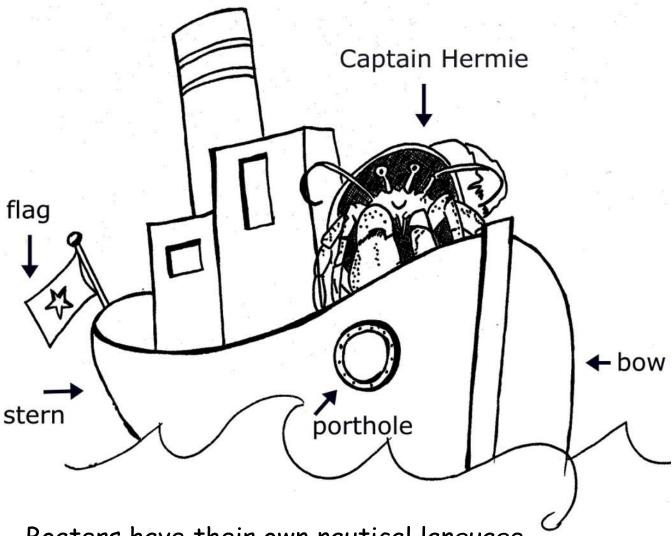
Cruise liner

Hermie's fun fact:

Ships coming through the Canal carry all kinds of cargo. They carry people, cars, oil, cement, fish, sneakers, televisions, rubber ducks, and almost anything else you can think of!



Color in Hermie and his boat.



Boaters have their own nautical language. Learn some of the terms below!

aft - near the stern or back end of the boat

ballast - any material carried on a ship to make it stable or balanced

bow - forward end of a vessel

charts - maps used on a ship

crew - the people working on the boat

deck - the floor on a ship

fathom - a nautical measurement that equals six feet

gangway - the ramp to board a boat

keel - the centerline on the bottom of a ship

lines - the ropes on board a boat

port - the left side of a ship, or the city a boat goes into

porthole - a window on a ship

radar - an electronic device for determining location

starboard - the right side of a ship

stern - the back end of the boat



Nautical Terms

Word Search

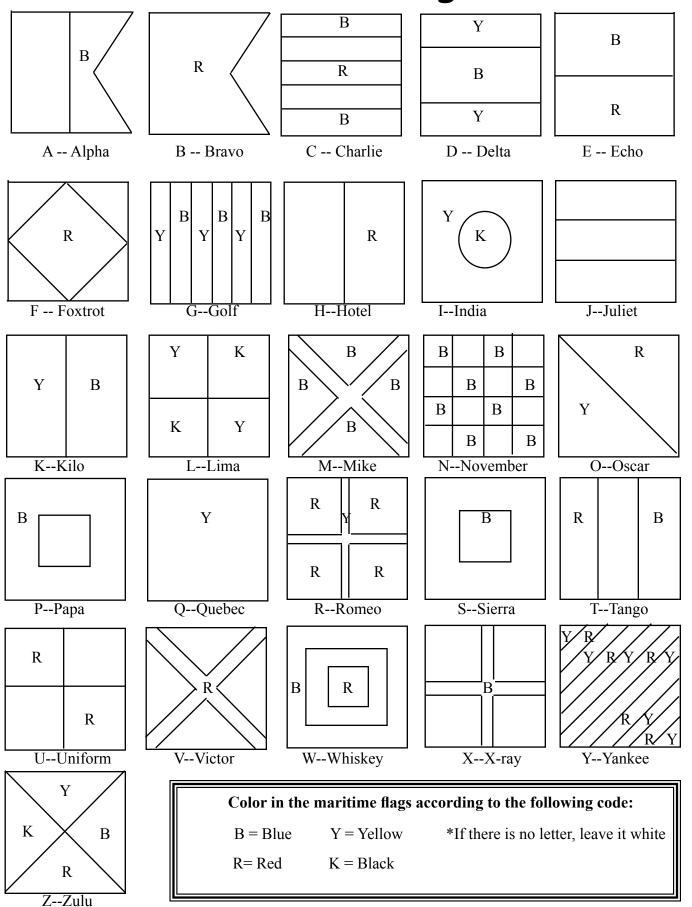


Look across, down, diagonally, forwards, and backwards to find the following nautical terms.

GANGWAY **AFT CREW PORTHOLE ANCHOR** DECK KEEL RADAR BALLAST DOCK KNOT STARBOARD **STERN BOW ENGINE** LIFEBOAT BRIDGE FATHOM LINES

CAPTAIN FLAG NAVIGATION CHARTS FORWARD PORT

Maritime Flags



Hermie's fun fact:

Maritime Flags are used for communications. Ships can relay messages to each other or send messages from ship to port. Each flag stands for a letter of the alphabet with a key word for each letter. Each also has a specific meaning. For example, the flag for the letter 'A' is called 'Alpha', and it also means "diver down; keep clear". You can learn more about maritime signal flags and their meanings at your local library or on the internet.



Using maritime flags, try spelling your name in the boxes below, or pretend you are communicating with another ship and want to send them an important message.



Water Safety!

Test your water safety knowledge with the following quiz. Choose the most correct answer

- Never swim alone. Always swim with a ______.
 A. frog B. buddy C. inner tube D. fish
- 2. The most important item you have to wear on a boat is your _____.

 A. hat B. sunglasses C. life jacket D. sunscreen
- 3. Never jump or _____ into unknown waters.

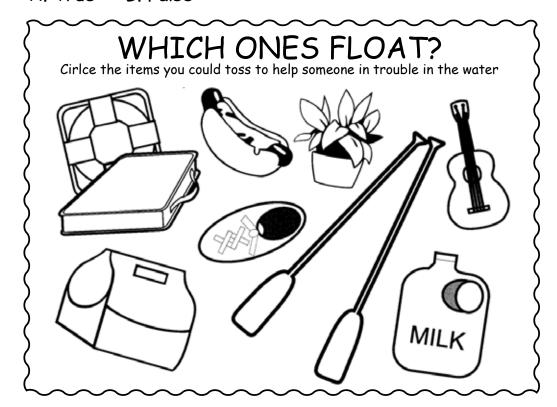
 A. ski B. dive C. splash D. run
- 4. Always swim in _____ areas.

 A. designated B. muddy C. swampy D. large
- 5. Swimming is _____ allowed in the Cape Cod Canal.

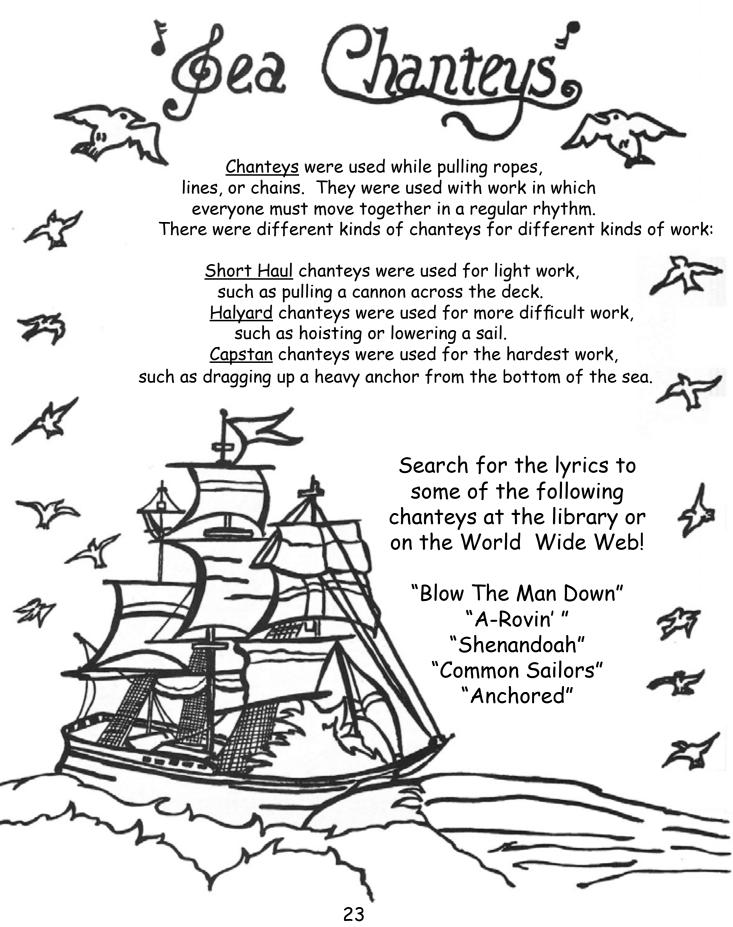
 A. sometimes B. always C. never
- 6. It's okay to pretend that you are drowning.

 A. True B. False
- 7. Never rely on toys such as inner tubes and water wings to stay afloat.

 A. True B. False



The life of a sailor on the old sailing ships was a hard one. To make the work easier, they sang songs called Sea Chanteys.





This is a sea chantey that a fourth grade class at the Teaticket School of Falmouth wrote for the Canal.

1. Oh, the Cape Cod Canal is big and wide (Heave, Ho, don't you want to go?)
You can see those boats from either side (Heave, Ho, let's all go!)

Chorus:

Cape Cod, Cape Cod Canal

Cape Cod, Cape Cod Canal

2. Oh, the water's blue and it's pretty too (Heave, Ho, don't you want to go?) See those boats just a coming through (Heave, Ho, let's all go!)

Chorus

3. Oh, the bridges stand both big and tall (Heave, Ho, don't you want to go?) I sure do hope they never fall (Heave, Ho, let's all go!)

Chorus

4. There's even a bridge that goes up and down
(Heave, Ho, don't you want to go?)

Just so the trains can come to town (Heave, Ho, let's all go!)

Chorus

5. The whole world comes right of these shores
(Heave, Ho, don't you want to go?)
I'm proud this canal is mine and yours (Heave, Ho, let's all go!)

Chorus

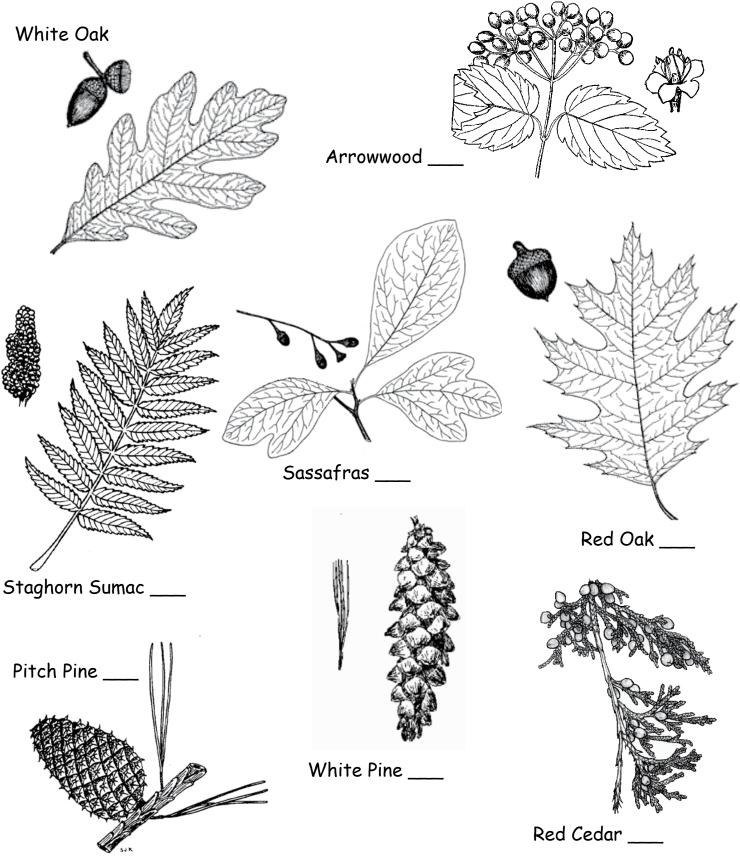
6. From the bridges you can see the great sun set The prettiest you've ever seen yet

"My Chantey"

Write a sea chantey of your own! You can sing it while washing the dishes, cleaning your room, or mowing the lawn.

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Cape Cod Canal Trees



Match the description of the tree to its picture. Write the number on the line next to the name of the tree.

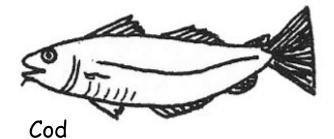
- 1. This is the only tree to have three different shaped leaves. If you scratch the stem or root it smells like root beer. It is the only North American spice.
- 2. This shrub has very straight stalks. Native Americans used its branches to make arrows.
- 3. This tree has leaves with pointed edges. Its acorns are rounded. Its inner bark is used for dye and as a source for tannin for softening leather.
- 4. This tree has needle clusters of three. It gets its name from the large amount of resin it produces. This tree is well adapted to survive after a forest fire.
- 5. This tree has large red berry clusters and the newly grown stems are furry. Unlike its close relative, poison sumac, it is not poisonous. The berries can be used to make a lemonade-like drink that is high in vitamin C.
- 6. This tree has shaggy bark. It has small scale-like leaves. The wood is very fragrant and is used for hangers, chests, and closets.
- 7. This tree has leaves with rounded edges. The acorns are more oval in shape and are an important food source for many animals.
- 8. This tree has needle clusters of five. The tree matures when it is 200 years old. Colonists used the straight, tall trunks for ship masts.

Cape Cod Canal Fish

Draw a line to match the picture of the fish to its description



Bluefish

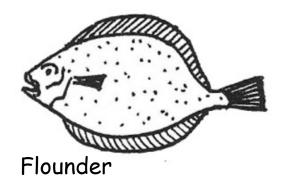


THE RESERVE OF THE PARTY OF THE

Striped Bass



Mackerel





This fish is very popular. It is known by the stripes that run across its sides.



This flat fish lives on the sandy sea floor and flaps its fins to cover itself with sand for camouflage.



This fish is named after its coloring and is caught in the Canal during the summer. Beware of their sharp teeth!



This fish was once abundant in the area and is how Cape Cod got its name.



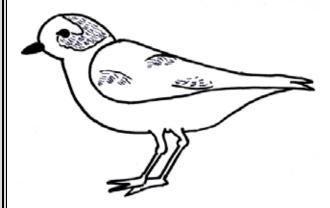
This small fish is a fast swimmer. It is an important food source for many other fish and anglers use them as bait.

Canal Area Birds

These are just a few of the many birds you may see along the Canal.

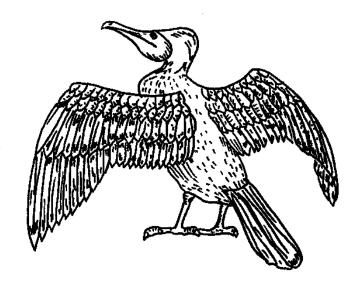
Try to find some other birds, and use a field guide

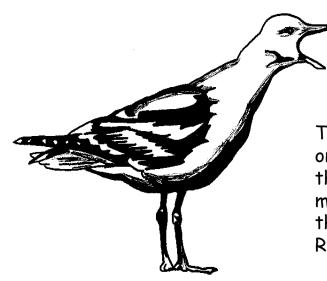
to help you identify them.



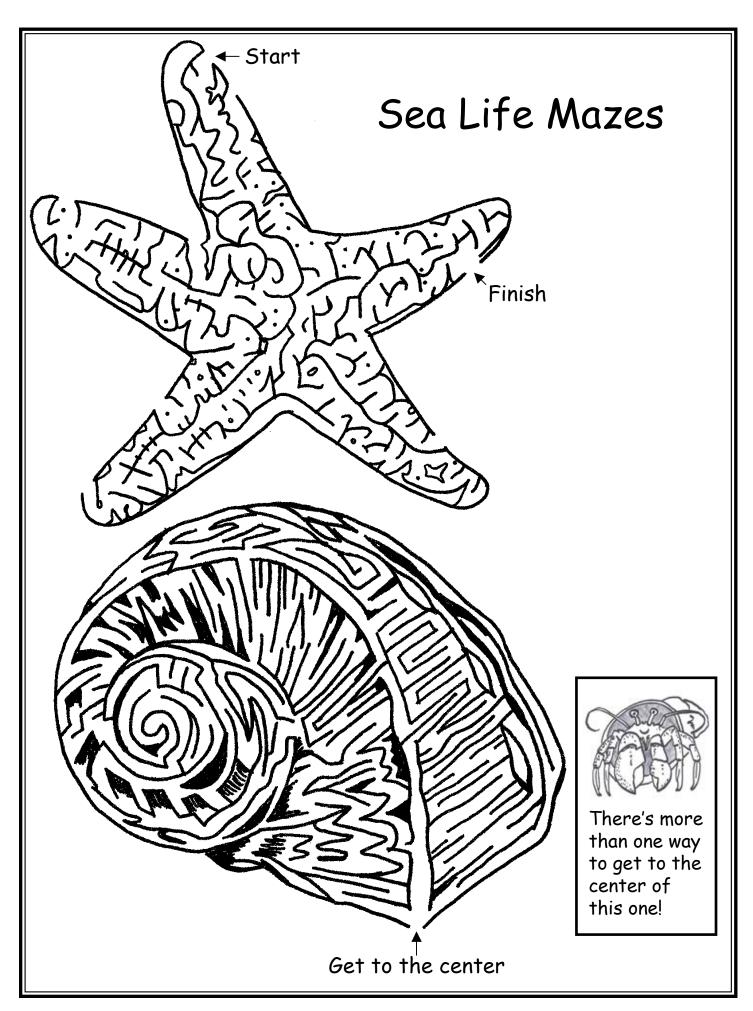
The piping plover is an endangered shorebird that can be found along sandy beaches and dunes. They nest on beaches, where their eggs and hatchlings camouflage with the sand. Sadly, many of their nesting sites have been negatively affected by recreational activities and commercial development along the shoreline.

The double-crested cormorant is a black bird with yellow-orange facial skin. They have a hook at the end of their beaks that help them catch fish under water. Cormorants are often seen resting atop the Canal's navigation light poles with their wings spread out to dry.



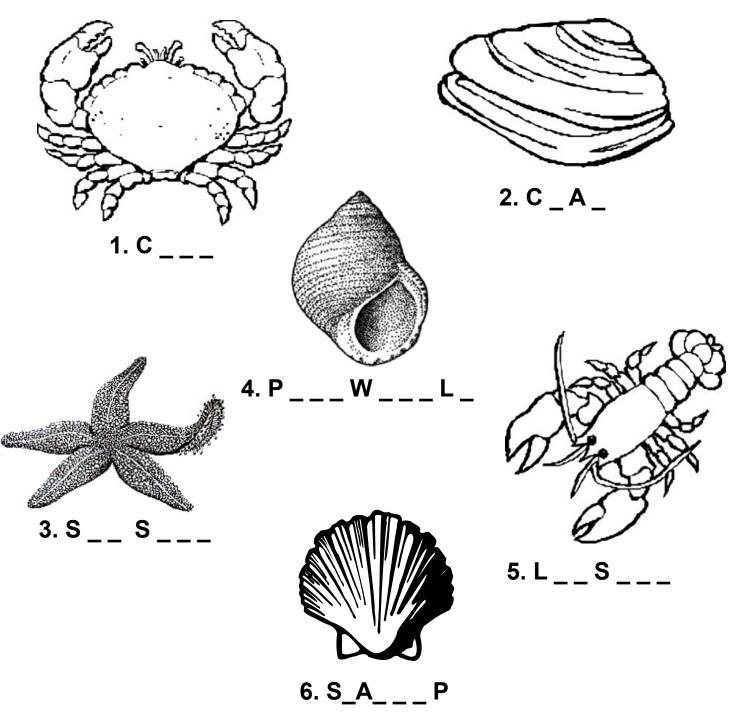


The gull is a scavenger that feeds on almost anything. In this area there are a variety of gulls you might see. The most common are the Great Black-Backed Gull, the Ring-bill Gull and the Herring Gull.



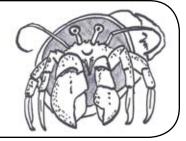
These are some of the animals that can be found along the beaches and in the water near the Canal.

Can you name them?



Hermie's fun fact:

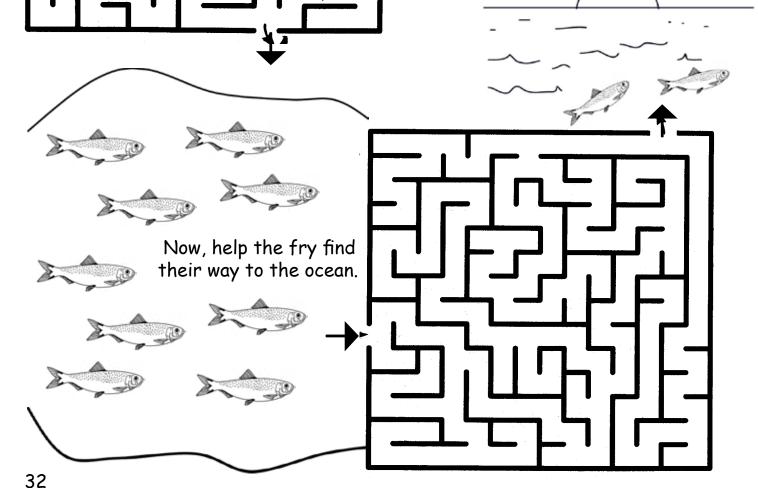
Did you know that hermit crabs regularly move into new homes? When a hermit crab outgrows its current home (its shell) it shops around for a new larger one.



Help the herring find its way to Great Herring Pond to spawn.

Herring Life Cycle

River Herring are anadromous fish; this means they spend most of their lives in saltwater but travel to fresh water to spawn (lay their eggs). From the Cape Cod Canal, herring migrate up the Bournedale Herring Run to reach their fresh water spawning grounds in Great Herring Pond every April and May. Once they reach the spawning grounds, each female lays 60,000-100,000 eggs, which hatch in about one week. Young herring are called "fry". The fry stay in freshwater until they reach 2-6 inches in length. Late summer and early fall, they journey downstream through the Canal to the ocean. There they remain until becoming an adult at age 3 or 4, and migrate back through the Canal to the freshwater where they were born.

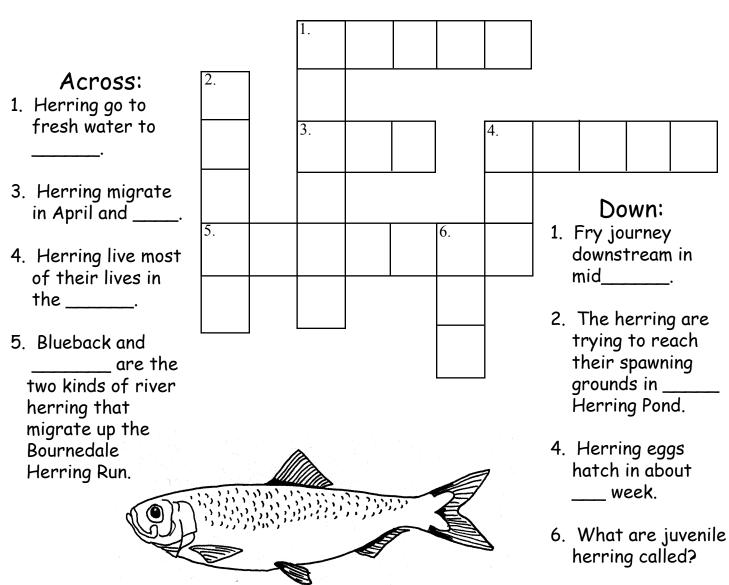


Bournedale Herring Run

The Bournedale Herring Run is used by Alewife and Blueback herring to reach their spawning grounds.

Herring are an important food source for many animals such as fish, birds, seals and humans. To keep up herring population numbers, many people work together to help them on their journey.

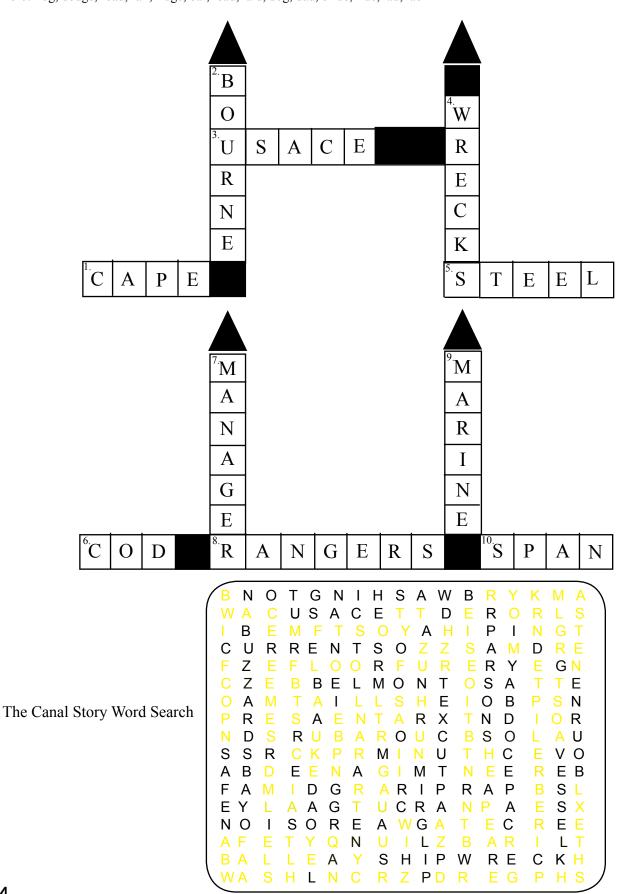
The U.S. Army Corps of Enigineers is reponsible for the lower part of the herring run, annually cleaning and inspecting the run's fish ladders and resting pools. They work with other partners like the Town of Bourne and the Commonwealth of Massachusetts to manage the herring run, provide and monitor catching services, and to establish and enforce regulations that protect the herring.



Answers

How many shipwrecks? 50

Railroad Bridge - Here are some words that can be found using the letters in the words "Railroad Bridge", but there are many more! log, dodge, road, rail, ridge, bar, load, laid, dog, dad, bride, ride, lad, lab



Nautical Terms Word Search

| N E C W Z Q K K P B F Y M S B P P | FOGRGT > NOPJUARLSR | B O I D E E Q O R P L N X L E A R | D N R T I W E T T T C Z A Y D I T | U I J W A R E D H H I B A A Q I D | S A L G A G B L O L M W R D R O U | XTOFSRIRLPGDRKAKD | I P E O E H D V E N D H D H O E G | B A L U N S F X A S T E R N C W Y | K C U N I P Y G L N S H J K K Z F | LPHFLAGIBALLASTVZ | Y O G A K O F Y W H G A K I U B D | U K G C R E I H O T Y H V L R O J | T C O M B T S T B D R W V Y T E X | F D E O W O S E F G I O B O P V G | Q E A D R A O B R A T S P L G Q G | C T C L E E K H V R O V Z Q O I M | C G S > J X O J L A R G M O H F A |
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| E | Ν | G | 1 | Ν | Е | Q | Е | G | F | J | K | Р | Н | Т | 0 | Q | F |

Water Safety Quiz

1. B 2. C

3. B

4. A

5. C

6. B

7. A

WHICH ONES FLOAT?



Trees Around the Canal

- 1. Sassafras
- 2. Arrowwood
- 3. Red Oak
- 4. Pitch Pine
- 5. Staghorn Sumac
- 6. Red Cedar
- 7. White Oak
- 8. White Pine

Canal Fish

This locally popular fish is known by the stripes that run down its sides.

Striped Bass

This flat fish lives on the sandy sea floor and flaps its fins to cover itself with sand for camouflage. Flounder

This fish is named after its coloring and is caught in the Canal during the summer. Beware of their sharp teeth!

Bluefish

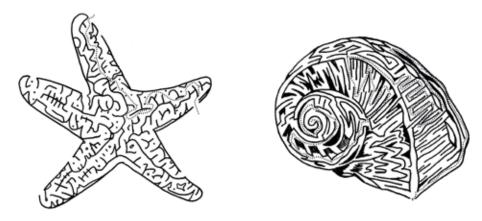
This fish was once abundant in the area and is how Cape Cod got its name.

Cod

This small fish is a fast swimmer. They are an important food source for many other fish and anglers used use them as bait.

Mackerel

Sea life mazes



Sea life words

1. CRAB 2. CLAM 3. SEA STAR 4. PERIWINKLE 5. LOBSTER 6. SCALLOP

Herring Crossword

