

# Water - Way to Get Around

**B**oats of all kinds have been key players in the Chesapeake Bay's history. In this activity, students use a dichotomous key to learn about some types of boats used on the bay. They also build models of the boats and float them at a local park.

## Background

Native Americans of the Chesapeake region traveled and traded over a wide area. They used log canoes to travel by water. The larger loads of the early European settlers were most easily shipped by water. As a result, their farms and villages grew along the shores of the Chesapeake and on the banks of its rivers. For the first 200 years of European settlement, ships and boats were the most important transportation in the Chesapeake region.

Towns for trading and shipping usually sprang up on rivers at the fall line, where the rivers tumble through rapids and waterfalls on the edge of the Piedmont before meeting the placid tidal waters of the coastal plain. Richmond, Alexandria, Fredericksburg and Petersburg were all built on a fall line.

Until the 1800s when canals were dug alongside the rivers, the fall line was the point at which goods and crops had to then proceed over land. The remains of canals can be seen today along the James, Potomac and Susquehanna rivers above the fall line. Boats were towed up and down the canal by mules or other animals. The C&D Canal, which connects the upper Chesapeake Bay with Delaware Bay, is still in use, not only by ships but also by migrating striped bass.

Hundreds of kinds of boats and ships have sailed the Chesapeake Bay, serving every possible use: transportation of people and cargo from across a creek or around the world, fishing, piracy,

fighting wars and racing. Some boats and ships are unique to the bay. Nine of these, the log canoe, sailing log canoe, skipjack, deadrise, yawl boat, Baltimore clipper, pungy, bugeye and ram, are illustrated and described in this activity. Many of these traditional boats can be seen in Baltimore Harbor.

## Procedure

### *Before the Trip:*

1. Introduce the topic of boats by compiling, as a class, a list of "boats we have been aboard." For each, note its purpose, approximate size and unusual features.
2. Obtain some historical material about the use of boats in the Chesapeake Bay region. Try "Chesapeake Bay Notes and Sketches" by Carvel Hall Blair and Willits Dyer Ansel, "This Was Chesapeake Bay" by Robert H. Burgess and "The Lord's Oysters" by Gilbert Byron.
3. Select and assign student reading (fiction or non-fiction) about pirating, shipping, travel or other use of boats on the bay. For secondary students, many sections of James Michener's novel "Chesapeake" or William Warner's "Beautiful Swimmers" would be appropriate.
4. Divide the class into workgroups of two or three students.
5. Distribute copies of the accompanying Bay Boats Dichotomous Key and Bay Boats to each group.
6. Review the dichotomous key instructions and "Special Boat Words" with the class. Explain that the key is similar to the kind of key scientists use to identify plants and animals.
7. Compare the group's results. *Did all groups arrive at the same identifications?* Discuss.

## Grade Levels: 4-8

### Objectives

Students will investigate variation in boat design by:

- using a key to classify types;
- constructing models of various types;
- observing behavior of models on moving water.

### Materials

- copies of information sheet and dichotomous key provided
- pencils and clipboards for each student or group
- a supply of cleaned trash, paper, cardboard and natural materials for building models
- tape, glue, staples, string, rubber bands and scissors
- fishing line
- stakes or other markers
- stopwatch
- tape measure
- "wetable" footwear

### When

Late spring through early fall is the safest time to work around the water.

### Time Required

At the Site: Sailing trials could take from 20 minutes to an hour, depending on conditions, number of boats and number of trials.

### Extensions

#### **Gifted/Advanced:**

Locate pictures and descriptions of several other bay boats or ships. Expand the dichotomous key to classify them or design original keys to classify the boats in other ways.

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- With the class, plan a boat building session (or two). Students, working in small groups or individually, design and construct a facsimile of one of the nine boats pictured on the Bay Boats sheet. Discuss options for construction materials and assign responsibility for procurement. Materials could include cleaned pieces of trash (which would fit in with a lesson on litter pollution) or natural materials. Hulls could be made from plastic tubs or plastic or cardboard milk cartons. Be sure to tie a long piece (several meters) of fishing line to each completed model so that it doesn't sail away to become litter.
- Do a "test float" in the sink or bathtub before field trip day. Students should tinker with their designs until they float with some stability.

### At the Site:

- Take the models to a stream or other body of water at the site. Find a location where the current seems to be moving gently. Float a leaf to check speed and direction. Be prepared for wet feet.
- Mark a starting point and finish line along the bank (perhaps 2 or 3 meters apart, depending on current speed).
- Maneuver the vessels along a starting line so that their handlers are holding them and standing behind them (up current). Release the boats, but hold on to the fishing line. Select a few students to clock the amount of time it takes for the vessels to reach the finish line. Time no more than four or five boats together to minimize collisions.
- Repeat this once or twice (time permitting) for a more accurate experiment and average the times for each type of vessel. Be sure to collect all boats from the water when the activity is over.

### Follow-up:

- Discuss:
  - If you had to make your boat go faster or slower, what are the options?*
  - Are some designs better than others for certain purposes?*
  - Which is more important: current, wind or auxiliary power?*
  - If you could own one of these boats, which would you want? Why?*
  - How have boats changed or stayed the same over the last 200 to 300 years?*
  - Are any non-power boats still used? Why?*
  - What kinds of boats are most common today? Why?*
- Examine a map of the whole bay or one of its tributaries and identify places where these bay boats may

### Credits

Adapted with permission from The Changing Chesapeake. 1989©. "Travel and Trade in Early Times; Working Boats and Ships of the Chesapeake Bay." V. Chase. National Aquarium in Baltimore, MD.

### Additional Resources

- Virginia Trekkers: Podcast # 7 Fall Line
- Chesapeake Bay Boats
- Chesapeake Bay Program 10 Boats of the Chesapeake Bay

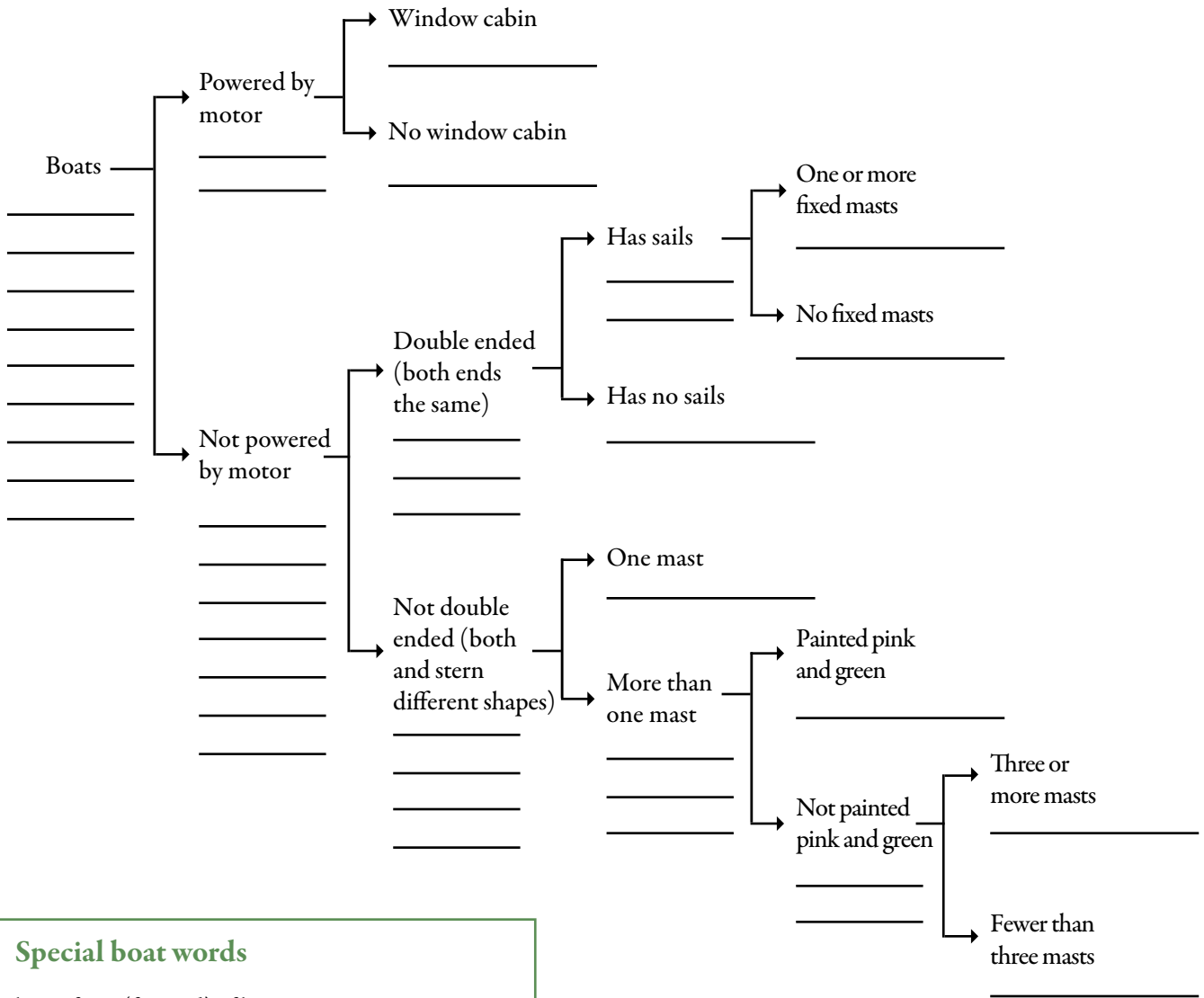
have actually worked. Select some points between which some of the boats may have traveled in a day. Consult the map legend for scale and note how many miles this typical day's run might have been.



# Bay Boats Dichotomous Key

**Directions:**

- Look at the pictures and read the descriptions on the Bay Boats page.
- Write the number listed for each boat under the word “Boats” below.
- Follow the arrows to the right and write the number under each heading for each boat that fits the description.
- When each arrow stops, and there is only one answer, write the name of the boat under the description.



**Special boat words**

- bow - front (forward) of boat
- stern - back (aft) of boat
- masts - poles that hold the sails upright
- sloop - boat with one mast
- double ended - identically shaped bow and stern
- schooner - boat with two or more masts close together
- topmasts - additions on top of masts
- raked masts - tilted backwards toward the stern

## Bay Boats

1. **DEADRISE:** Common watermen's workboats used for crabbing oystering, clam dredging and fishing. Often up to 45' long with a small cabin in front. Motor powered.



2. **SKIPJACK:** Used for oyster dredging in Maryland, they are the last commercial sailing fleet in the United States. Graceful boat with sharp bow, squared stem and a single mast with sloop rigged sails.



3. **SAILING LOG CANOE:** These fast boats were adaptations of the Native American log canoes. Bow and stern pointed, made from five logs and two removable masts.



4. **BALTIMORE CLIPPER:** Common in the early 1800s these very fast ships carried cargo all over the world. Two raked masts, schooner-rigged.



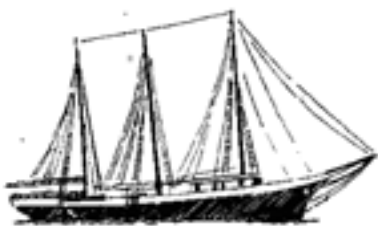
5. **LOG CANOE:** Native Americans made these open boats by repeatedly burning and scraping a single log. Both ends pointed, paddle powered, up to 50 feet long.



6. **YAWL BOATS ("PUSH BOATS"):** These little motor boats evolved from small boats carried by large sailing ships. They are used today as mini tugs which provide power for skipjacks.



7. **RAM:** Three or four masts, long, narrow and slow, these narrow schooners were sailing barges used in the C&D Canal at the top of the bay.



8. **BUGEYE:** Double ended with one fixed mast, these ships dredged oysters and hauled vegetables, lumber, coal and illegal whiskey.



9. **PUNGY:** Similar to the Baltimore Clipper but designed for use on the bay. Schooner-rigged, two curved masts, typically painted pink and green.

