sea
explorer

# SAFE-BOATING

instructor's
guide

SMALL-BOAT
HANDLER

FOR SEA SCOUTING

BOY SCOUTS OF AMERICA

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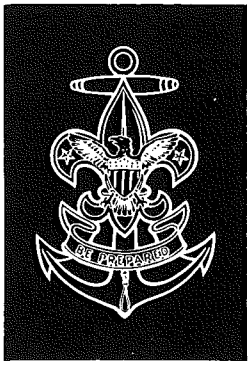

# THE SAFE BOATING COURSE

The Optional Recognition Plan is for Sea Explorer ships whose members are not interested in following the advancement plan that leads to the Quartermaster Award. It is a much less-rigid method of attaining recognition. Instead of each Sea Explorer achieving ranks through set requirements, the membership of the ship works as a group in this Safe Boating course. Those who complete the series are awarded an attractive certificate and the Small-Boat Handler bar. The main purpose of this course is to provide an additional incentive for Sea Explorers to acquire the skills of seamanship and boat handling.

## DESCRIPTION OF THE COURSE

The Safe Boating course includes the fundamentals of aids to navigation, Rules of the Road, and Boating Safety. Boys who have not had extensive experience in Sea Exploring or in seamanship are the ones who benefit most from this elementary course. Give the Safe Boating course first and follow at a later date with the eight-session Advanced Seamanship course.

## METHODS OF CONDUCTING THIS COURSE

The instruction consists of three 2-hour sessions. The first is a brief but purposeful explanation of aids to navigation and Rules of the Road. The second covers elementary seamanship and boating safety. The third session must be conducted outdoors. It requires the Sea Explorers to demonstrate their ability in handling small boats.

The course may be offered in one of these ways:

1. Once a week for 3 weeks.
2. Three evenings in 1 week.
3. Three sessions in 1 weekend.

Regardless of the pattern of meetings, each session should be conducted exactly as presented in this guide. Adjustments and additions should be made only to meet local conditions and facilities.

## THE STAFF

This instruction is given by the ship's adult leaders assisted by qualified consultants who are secured locally. These should be men who have a thorough knowledge of the subjects and the ability to teach them.

## REFERENCE BOOKS AND MATERIALS

The instructors must follow this training guide closely for all three sessions. Their main reference should be the technical chapters of the *Sea Exploring Manual,* and the resource chapter should be a guide for securing additional reference books and necessary materials.

## QUALIFYING CERTIFICATE AND BADGE

Sea Explorers who satisfactorily complete the three sessions receive an attractive Safe Boating certificate

signed by the instructor. They become eligible to wear the Small-Boat Handler bar illustrated on the cover of this guide. The bar is centered 3/8" below the leading edge of the pocket on the Sea Explorer blouse.

As a small-boat handler, the Sea Explorer is qualified to operate small boats according to the regulations set by his own ship and the Rules of the Road that apply in his area.

## AWARDS AND RECOGNITION PROCEDURES

The Sea Explorers who complete the Safe Boating course do not have to be reviewed by the ship's officers. The Skipper approves the Advancement Report, No. 4417, and sends it in to the local council office. The formal presentation of both the certificate and bar should be made at a bridge of honor along with other Sea Explorer recognitions.

SAFE BOATING, SESSION 1

# AIDS TO NAVIGATION

Foreword to the instructor:

This session covers two subjects: Aids to Navigation and Rules of the Road. Acquaint yourself with the material before attempting to present it. You may use either the lecture as written out or follow the outline and supply your own explanation. Whenever possible, involve Sea Explorers in your presentation. For example, have them in turn place the description of a buoy opposite the correct diagram. Do not exceed 1 hour in this presentation but assure yourself that they understand the material.

## AIDS TO NAVIGATION

Aids to navigation are varied and extensive, all designed to make the operation of vessels safer and easier, much in the manner in which the highway department places road signs and signal lights. Aids to navigation include such items as lighthouses, lightships, tide tables, charts, fog signals, radio, loran, sonar, radar, and buoys. Because we could not possibly cover all these subjects in the time allowed, we will base this session on daylight operation.

## THE BUOYAGE SYSTEM

All Federal waters of importance in the United States are marked with an intricate buoyage system, maintained by the U. S. Coast Guard (since 1940). All buoys of permanent nature are shown in the local charts and in a publication known as *Light Lists*. All buoys tell their own story by shape, color, or number. The system calls for definition when such channels are entered from seaward. A good phrase to remember is "red right returning." In other words, when proceeding from seaward, keep red buoys on your right-hand or starboard side.

## CHART SYMBOLS AND LETTER DESIGNATIONS

The chart symbol for any buoy is a flattened diamond over a dot. The dot indicates the actual location of the anchor ring of the buoy. The symbol may show the color or be marked with the letter of the color, such as "R" for red. The type of buoy is marked with the letter of the shape such as "C" for can, "N" for nun, "B" for bell, etc.

## PRIMARY SHAPES FOR BUOYS

There are three primary shapes for buoys: nun, can, and spar. The nun is cone shaped at the top and the can resembles an oil barrel on end. The spar looks as if a slim piling had grown out of the water. There may be many other shapes of buoys such as buoys of steel framework on a float. These are usually lighted and have a bell, foghorn, or whistle. Some have a perch and ball, some a perch and cage; but for the purpose of this course we will consider the primary buoys.

## RED BUOYS

Red buoys are always kept on the right (starboard) side of the boat when approached from seaward. They have even numbers such as 2, 4, or 6, numbered from

seaward to inland. These buoys mark the right side of the channel. Although they may be any shape except a can, the most common buoy you will see is a nun. In secondary waterways, the spar is used.

## BLACK BUOYS

Black buoys have odd numbers such as 1, 3, or 5, numbered from seaward. They mark the left side of the channel. Always keep these buoys on your left (port) side when entering *from* seaward. They may be any shape except a nun, but the most common buoy is a can shaped.

## RED AND BLACK OBSTRUCTION BUOYS

Red and black buoys horizontally striped (stripes running around) are commonly called "obstruction buoys." They are found at junctions, middle ground, or over obstructions. The top color indicates the preferred channel. If the top bank is red, treat it as a red buoy; if it is black, consider it a black buoy. In any case, give it plenty of room and pass wide of it. In some cases the buoy will take on its shape from the top color, as a nun if the top color is red, as a can if the top color is black. But it could be a spar.

## BLACK AND WHITE MID-CHANNEL BUOYS

Black and white buoys with the stripes running up and down (vertically) are mid-channel buoys marking the center of the best channel. These may be passed fairly close, and, when there is a series of them, they may alternate from a can to a nun, etc.

## YELLOW BUOYS

A yellow buoy of any type indicates a quarantine anchorage area. Most yellow buoys are spars.

## WHITE BUOYS

A white buoy of any type usually indicates the limits of an anchorage area. This is specified on the charts. They may also mark out an experimental area or a torpedo range off a naval base, but the chart tells you if this is the case.

## WHITE, GREEN-BANDED BUOYS

A white buoy with a green-banded top indicates a dredging area.

## BLACK AND WHITE HORIZONTAL STRIPES

In some areas, particularly in the Chesapeake Bay, a black and white buoy with the stripes going around it (horizontal) may be seen. These mark the legal limits for the setting of fishnets or weirs.

## BEACONS, DAYBEACONS, ETC.

Other aids to be used in the daytime are varied and colorful. They are called beacons and daybeacons, and adopt local identification. For example, you may see a piling with a board or arrow pointing out the direction of the channel, a barrel on a pole, a structure of masonry, or woven slats. These are sometimes painted according to the color of their use, red and black.

## RANGES, RANGE MARKERS

Ranges or range markers are aids that line out the main channel where it is possible to use them. They consist of two marks—one behind and higher than the other. They are lined up like the sights on a gun and the boat's course is along this line.

## BUOYAGE SYSTEM FOR INTRACOASTAL WATERWAYS

Intracoastal waterways are bodies of water that extend inland of the ocean and usually parallel to it. With channels coming in to it from the sea, you can understand why they must have a slightly different buoyage system. If you turn either direction, which way would you use the buoys? This is determined by a clockwise system. On the Atlantic seacoast they are numbered and colored from north to south, and along the Gulf of Mexico, from east to west. Consequently, when entering one of these from the sea, the colors and numbers are used according to the direction of travel.

## COLORS ON INTRACOASTAL WATERWAYS AND CONVERSION POINTS

The buoys and other aids to navigation on the Intracoastal Waterways are distinguished from the regular harbor route aids by a yellow band or border. At the junction of the approaches, the buoys have yellow diamonds on them telling the seaman to convert at this point to the Intracoastal Waterways rules.

## HIGH LAKES AND OTHERS, WESTERN RIVERS

Many Sea Explorer ships operate on lakes or other bodies of water not under the control of the U. S. Coast Guard or the Inland Rules. Western rivers, such as the Ohio River and Mississippi above Cairo, Ill., have a buoyage and beacon system of their own. Instead of being related to the normal geographic and celestial navigation rules, they depend upon the local surroundings for definition.

## SEA EXPLORER SHIPS ARE TO DEVELOP OWN AIDS ON SUPERVISED LAKES

Mountain lakes and other areas not covered by any buoyage system are a problem. Many States are using their new boat regulation powers to solve this; but in areas where this has not yet been accomplished, we suggest that the Sea Explorer ship cooperate with local boaters in placing buoys and other aids in needed locations by hazards and obstructions. If the ship has a moorage on the lake, it would be wise to erect range markers for easy entrance to the dock. Another project would be the development of charts showing depths of water and hazardous rocks or obstructions, etc., in the area. A Sea Explorer ship in a State having its own buoyage system should be familiar with that system.

## CLASS PROJECT

Divide the class into two crews and conduct competition in buoy identification. Make up a set of flash cards of all the buoys described in the presentation. Line up the crews so that the first Sea Explorer in each file faces you. Flash a card and score 1 point for the crew whose man gives the correct answer first. Continue by having these two drop to the rear. Stop to discuss differences of opinion as necessary.

**BREAK**

# RULES OF THE ROAD

Foreword to the instructor:

For this second subject in the session, outline a boat with chalk on the floor, or set up your landship to illustrate the "danger zone" of the boat. If possible, have a blackboard for the purpose of further illustration.

Become acquainted with the material before attempting the presentation. Involve the students as much as possible in your demonstrations. You can use toy sail and motorboats to dramatize your lecture. Set up problems as you go and ask students to come forward and solve them.

## REASONS FOR RULES OF THE ROAD

Rules of the Road were passed to prevent collisions. Since boats can go anywhere on navigable waters, it is possible for many of them to arrive at the same point together. Some order must be followed in order to prevent collisions.

## WHAT THEY COVER

Rules of the Road cover Inland, International, Great Lakes, and local waters. The rules are applicable when the craft is under way. Under way means the boat is not tied to the shore (or pier, etc.), is not at anchor, is not aground, and is not drifting.

## THE DANGER ZONE

The *danger zone* is determined by the relative points on the starboard side. Use your landship or chalk outline here to demonstrate. Involve the students by placing them aboard and point out the danger zone. The danger zone is described as that area from dead ahead to two points abaft the starboard beam. This means slightly behind the imaginary line exactly in the center and at right angles to the boat on the starboard. It is called the danger zone because any vessel in this area is a potential hazard; she has the right-of-way over your boat.

## PRIVILEGED VESSEL OR BURDENED VESSEL

Any other vessel in this area (danger zone) is called the *privileged* vessel because she has the right-of-way. This makes your vessel the *burdened* vessel, and you have the responsibility of staying out of her way. The privileged vessel, in turn, has the responsibility of maintaining her course and speed. At this point, use the blackboard or place students in various positions around the marked-out ship or landship to illustrate right-of-way situations.

## SAILBOAT RIGHT-OF-WAY OVER POWER VESSELS

One thing to remember is that a sailboat nearly always has the right-of-way over a power vessel no matter what its position in relation to the powerboat. There are some situations where this is not true, such as when the sailboat is overtaking and passing the powerboat or when a small sailboat could cause danger to a large power vessel in a narrow channel.

## REASONS FOR SAILBOAT RULES

Sailing boats have their own rules regarding right-of-way in relation to each other. This is because their travel is governed by wind direction and the set of their sails.

## CLOSE-HAULED AND RUNNING FREE

Two terms are used here, *close-hauled* and *running free.* Close-hauled is when the boom is pulled in tightly, close to the center line of the boat, and the vessel is advancing into the wind. Otherwise the vessel is considered to be running free. This is a loose interpretation for the sake of right-of-way problems.

## RUNNING FREE TO STAY AWAY FROM CLOSE-HAULED

A sailboat running free shall keep out of the way of the sailboat that is close-hauled. In other words, the close-hauled vessel has the right-of-way.

## PORT TACK STAY AWAY FROM STARBOARD TACK

A sailboat that is close-hauled on a port tack—with her boom on the starboard side and taking the wind over her port side—shall keep out of the way of one that is close-hauled on a starboard tack. The tack is determined by the side over which the wind is taken.

## SAILBOAT WITH WIND ON PORT SIDE TO STAY AWAY FROM OTHER

When both are running free with wind on different sides of the boats, the vessel that has the wind on her port side shall keep out of the way of the other.

## WINDWARD STAY CLEAR OF LEEWARD

When both are running free with wind over the same side, the sailboat to the windward shall keep out of the way of the sailboat to the leeward. Demonstrate these situations with drawings on the blackboard.

## CLASSES OF MOTORBOATS

Motorboats are divided into four classes according to length. It is important to remember these classes because certain rules apply to each.

Class A is a motorboat less than 16 feet long.

Class 1 is a motorboat from 16 feet to 26 feet long.

Class 2 is a motorboat from 26 feet to 40 feet long.

Class 3 is a motorboat from 40 feet to 65 feet long.

## LIGHTS REQUIRED AND POINT SYSTEM

Since lights are required on these boats when operating between sundown and sunrise, and these lights are identified by the point system, review quickly the area of the danger zone. As you remember, this is from dead ahead to two points abaft the starboard beam. This is actually 10 points, and when 10-point lights are described, this is the area within which the lights may be seen.

## LIGHTS ON CLASS A AND CLASS 1 BOATS

Class A and 1 boats are required to have a combination light on the bow. This is a divided light with red showing on the port side from dead ahead to two points abaft the port beam—and a green light on the starboard side showing from dead ahead to two points abaft the starboard beam. Abaft of this and higher, these boats must show a bright white light which shows from any direction—a 32-point light. The green and red lights must be bright enough to be seen for 1 mile; the white light, for 2 miles.

## LIGHTS ON CLASS 2 AND 3 BOATS

Class 2 and 3 boats carry slightly different lights. The red and green lights must be separated and on the sides of the boats. They are still 10-point lights, but are individual and are fitted with *inboard shields,* which are boards or metal shields that prevent the light from being seen from the opposite side. The same rules regarding color apply with red on the port side and green on the starboard. Another white light is added. It is a 20-point light forward that shows from dead ahead to 2 points abaft both beams. Then comes the 32-point light, which is farther aft and higher than the others.

## EMERGENCY LIGHT

As a matter of practice, it is wise to carry an emergency light aboard such as a flashlight or lantern.

## HORNS AND WHISTLES

Class A boats are not required to have audible signals aboard, but all others must carry a horn or whistle. Class 1 may have the whistle, a hand or mouth operated horn, or an electric or air horn capable of producing sound that can be heard ½ mile. On class 2, it must be hand or power operated and audible 1 mile. On class 3, it must be power operated and audible 1 mile. In every case, it must be capable of producing a blast of 2 seconds duration or more.

## BELLS

Classes 2 and 3 also must carry an efficient bell, used when the boat is at anchor in fog except when anchored in a designated anchorage area.

## EXTINGUISHERS

All motorboats must carry the means for promptly extinguishing burning gasoline. The number and size of extinguishers are determined by the size of the boat. Carbon dioxide is the popular extinguisher now. Carbon tetrachloride is no longer allowed.

Outboard motorboats that do not carry passengers for hire and are less than 26 feet and of open construction are not required to carry extinguishers. They must carry them if there is an enclosed space, no matter how small. But it is wise to have one aboard even if it is not legally required.

## LIFE JACKETS

All motorboats are required to carry one lifesaving device for each person aboard. Buoyant vests and life jackets are the accepted devices, but it is suggested that no matter the size of your vessel, carry a ring buoy. All life jackets and buoyant apparatus must be of the Coast Guard—approved type.

## TEST

# AIDS TO NAVIGATION AND RULES OF THE ROAD

Hand out slips of paper and ask the students to number from 1 to 10 for the true and false test. When finished, have them exchange papers and mark their answers. The correct answers are circled on this page. Encourage discussion if time permits.

1. Nun buoys are always found on the right-hand side of the channel when approached from seaward. **True** **False**

2. Red buoys have odd numbers. **True** **False**

3. Mid-channel buoys are red and black. **True** **False**

4. Dredging areas are marked with yellow buoys. **True** **False**

5. Can buoys are usually red. **True** **False**

6. A boat has the right-of-way over any vessel appearing in the area from dead ahead to two points abaft the starboard beam. **True** **False**

7. A close-hauled sailboat is one driving into the wind. **True** **False**

8. A class 2 boat is one from 26 to 40 feet long. **True** **False**

9. Green running lights are shown on the starboard side of a boat. **True** **False**

10. Class 2 and 3 boats carry a bell in addition to a horn for signals. **True** **False**

(In order to pass, the student must have seven correct answers.)

SAFE BOATING, SESSION 2

# BOATING SAFETY

Foreword to the instructor:

Session 2 covers two subjects: Boating Safety and Seamanship. Boating Safety is primarily a session of do's and don'ts. Since this course is geared to the smaller boat, such as the outboard and limited capacity boats, most of the material concerns them. Good boating habits practiced aboard the small craft can be expanded to fit the larger vessels.

Visual aids will help if they are available. A gasoline can with a metal spout to illustrate grounding the filler nozzle, an outboard engine, or even a small model boat will help emphasize the points being made. Demonstrate and let the students practice the proper manner of putting on a life jacket.

## BOATING SAFETY AND FIRST AID

Boating safety is better than first aid: Prevention is better than a cure. Experience is the best teacher. Though this cannot be obtained in the classroom, instruction is important; knowing what to avoid can prevent many of the troubles that beset boatsmen.

## DEVELOP A CHECKLIST

Because even the most experienced seaman could overlook some item of importance, veteran operators have developed a system for the inspection of their boat and its equipment before leaving the dock. In order to get acquainted with this routine, newer boatmen find it handy to have a checklist of needed items. They make a regular inspection from this list prior to casting off. Each student should make a list as the lesson proceeds and compare his with the others after the session.

To begin the checklists, refer to the last session and note the items required by law for our boat first. From then on, have everyone write down whatever he thinks should be on the checklist as he hears it discussed.

## CHECKING THE HULL

A good boatman looks at the water inside as well as outside of his boat. Water collected inside may have come from rain, snow, or perhaps a leak in the boat. The boat should be pumped or bailed, and the hull should be checked for leaks. If there are trouble spots, repairs should be made prior to using the vessel. Prevention could help here; a good boat cover of some sort would prevent the accumulation of water from rain or snow. In any event, a seaman will not put out in a leaky boat.

## MOTOR SIZE COMPARED WITH THE BOAT

No matter what the design of boat, it should be fitted with the proper power. Outboard boats are sometimes high in the bow but with very little freeboard at the stern where the motor fits the transom. Too much power may cause the bow to raise further and the stern to sink further and swamp the boat. Since the hull is made to plane, too small a power plant may cause the boat to drag and be difficult to maneuver.

## FUELING—NEVER LEAVE WITHOUT ENOUGH

The next consideration is fuel. A good boatman certainly should not leave without enough fuel to get where he is going and back again—in addition to a safe reserve supply. Proper handling of fuel is the best prevention of fire.

## DANGERS OF GAS VAPOR

Gas vapor is 3 to 4 times heavier than air and will settle into the bilge or lower compartments of a boat. It is as dangerous as dynamite since half a cup of gasoline vapor is enough to blow most decked-over-boats to bits. It ignites quickly from a spark or fire. Therefore, the fuel lines must be checked for leaks and improper connections. Leaky containers or any other fuel drips that may cause a serious accident must be avoided.

## PRECAUTIONS WHILE FUELING

When fueling, the "no smoking" rule goes into effect even if it is necessary to station a watch nearby to see that no one comes into the area with a cigarette or pipe. If the outboard is operated from containers instead of the tank atop the motor, these containers must be taken ashore to fill. This prevents the gasoline from getting into the bilge. If a gas-oil mixture is used, this too is prepared on the dock or ashore. Be sure to ground the nozzle against the tank opening while fueling to prevent static electricity.

## EXTINGUISHER STANDING BY

While filling tanks, someone should be stationed with a fire extinguisher as an added precaution. If additional fuel is carried aboard, the containers should be stowed in an open part of the boat and secured to the deck or the boat so they won't shift. After fueling, another check should be made for leaks and poor fittings.

If the boat is enclosed with any type of cabin, all fans or electrical equipment, engines or motors should be off while refueling. All ports, windows, doors, and hatches should be closed before and during the fueling process. After fueling, everything should be opened and aired out completely, running the blowers if any are aboard. This ventilation should be for a full 5 minutes before starting the engines. The smoking lamp remains out during this period also.

One final safeguard: If the boat is outboard powered, a check is made to be sure the safety chains are securely attached to the boat.

## LOADING SMALL BOAT

Care should be taken when loading a boat to ensure proper trim. If the boat is small, the operator or person who is going to run the boat should hold it in steady against the dock while his passengers load aboard. He should instruct them to hold securely to the boat, stay low and in the center, and stay still in their assigned places until the boat is loaded. He watches to see that the boat is not overloaded and that it sits level in the water.

## WHEN NOT TO GO OUT

A wise seaman never goes out when weather conditions are bad. The dangers of running aground, collision, or getting lost are always present when attempting to operate in fog or other periods of limited visibility. It is much better to give the boat two pats on the gunwales and go home.

## OPERATING

If caught out by a sudden fog, the seaman should remember that the law states that the boat should be operated at a speed that would allow it to stop in time to avoid an accident. This would indicate that the speed should be gauged so that the boat could stop in one half the distance of visibility. If lost, he should stop and anchor until his position can be determined or the fog lifts.

## DISTRESS SIGNALS

If aground or the engine quits, or some other situation arises that means trouble, other boatmen are ready to assist when their attention is obtained. Distress signals are specified as controlled rockets or flares, controlled fires, blasting the horn continuously, ringing the bell constantly, and flying the ensign upside down. Holding the arms out and slowly raising and lowering them is a recognized distress signal or just calling for help. If in trouble, the boatman should not hesitate to get help in any way he can.

## EQUIPMENT SUCH AS ANCHORS AND LINE SIGNALING EQUIPMENT, FIRST AID KIT

We have mentioned anchoring if caught in the fog. This means there should be an anchor aboard and sufficient line for it. Also there should be something to signal with. A first aid kit is also indicated. None of these things is required by law, but the good seaman includes all of them on his list.

## PROJECT

At this point, ask each student to complete his checklist of equipment that should be aboard. After giving a brief period to do this, check to see who has the best list. Discuss briefly any omissions or differences.

**BREAK**

# SEAMANSHIP

Foreword to the instructor:

This session starts out with the basic language of the sea. Read the terms and then see who can give you the proper definitions. If time permits, turn to the "Glossary of Sea Terms" in the resource chapter of the *Sea Exploring Manual.*

Have about a 2- or 3-foot piece of line for each student to tie the basic knots and a jackstay (large line tied between two points) or length of pipe, oar, or similar object for this purpose.

Describe the knot and its purpose while the student is standing by to tie it. After each student has mastered it, go to the next knot. If possible, obtain a cleat (or make one) and demonstrate belaying to it. Let everyone try it.

Start the session with these nautical terms:

ABAFT—Toward the stern.

ALL HANDS—The entire ship's company.

AMIDSHIPS—The middle third of the hull between bow and stern.

ALONGSIDE—Beside a pier or another vessel.

ANCHOR AWEIGH—Anchor clear of the bottom.

AYE AYE, SIR—Meaning "I understand," acknowledging an order.

YES, SIR—Answering a question.

BELAY—To make a rope or line fast without hitching or seizing it.

BOLLARD—An upright wooden or iron post on a pier.

BOW—The forward end of a vessel.

BULKHEAD—An interior partition aboard a boat (a wall).

BIGHT—The bend or loop in a rope.

BILGE—The lowest inside part of a vessel.

BOATSWAIN'S PIPE—An instrument used in piping orders.

CAST OFF—To let go a line.

CHAFE—To wear the surface of a rope or line.

CHART—A map showing characteristics of the bottom and shoreline for navigators and pilots.

CLEAT—A fitting of wood or metal with projecting horns around which lines are made fast or belayed.

DECK—The walking surface of a boat or ship (the floor).

COURSE—The compass direction steered by vessels, expressed in degrees.

ENSIGN—The American flag or any flag carried by a ship at the stern staff or gaff when under way to show her nationality.

FAIRWAY—Open channel, mid-channel, or cleared area through an anchorage.

FLOOR—The bottom of a vessel on each side of the keelson.

FENDER—A device to place between a boat and the pier or another boat.

FORWARD—In the direction of the bow.

FOUL—Opposite of clear. A tangled line or a bad situation such as bad weather.

FREEBOARD—The distance from the waterline to a vessel's deck.

GALLEY—A nautical kitchen.

HEAD—The compartment with a toilet.

HEADWAY—When vessel is moving ahead.

HEEL—To list over.

LEE—The side opposite to that from which the wind blows.

TRIM—Vessel's position in the water with reference to her waterline.

STARBOARD—Right side of vessel facing forward.

PORT—Left side of vessel facing forward.

SECURE—To make fast, safe. And make shipshape.

STERN—After end of a vessel.

UNDER WAY—When a vessel is not at anchor, made fast to shore, aground, or drifting.

## KNOTS

Set up the jackstay or poles. Make sure all students have a line for this project. Try one knot at a time, explain its use, and have everyone tie it. Refer to the *Sea Exploring Manual* for an illustration of each knot.

## THE OVERHAND KNOT

Is the start of many knots and hitches. Used as a stop.

## SQUARE KNOT

This is used to tie reef points when reefing sails, as awning stops, and for binding packages. It has one serious fault, it jams and becomes difficult to untie unless one end is slipped as shown in the illustration in the *Sea Exploring Manual.* This knot should never be used to tie two lines together.

## SHEET BEND

This is sometimes known as the weaver's knot. It is used to tie two lines of different sizes together. The knot will not slip even though there is a great difference in size of lines. For maximum holding power, the ends of lines should be stopped down (tied to the standing parts with small stuff).

## BOWLINE

This is the seaman's standby. It does not slip, pinch, or kink the rope as much as some knots. It does not jam and become too difficult to untie. It is used wherever a secure loop is needed in the end of a line. The bowline is also used to secure a line to an anchor when there is not time to make a splice.

## CLOVE HITCH

This is used for making a line fast *temporarily* to a pile or a bollard. It must remain taut with pressure on it, as it loosens easily.

## TWO HALF HITCHES

This consists of a turn around a bollard, pile, timber, or stanchion with a clove hitch around the standing part of the line. It has good holding power, but it also needs steady pressure.

## BELAYING TO A CLEAT

A turn is made around the cleat first in such a manner as to obtain the maximum hold against the boat. Then a bight is formed in the fall, turned half over, and slipped over the cleat ear. If needed, the same is done with the other ear. If too many turns are taken over the ears, it is difficult to get free, particularly if there is a current and pressure is great. Continue this until the entire class can tie all of the knots and belay correctly to a cleat. Take your time. Explain that the real problem with knots is to select the few to tie correctly—the ones that are of the most use on a boat. Splices are better than knots when eyes are needed or for fastening two lines together, but knots are faster.

SAFE BOATING, SESSION 3

# BOATING SAFETY AND SEAMANSHIP– AN OUTDOOR SESSION

Foreword to the instructor:

This entire session is to be done aboard a small boat, preferably an outboard craft. There are certain specific problems to be carried out and scored by you. The students are required to accomplish the problems in a satisfactory manner according to your judgment. If the class is large, you may need more than one judge and more than one boat. Or you may have to hold the final session in stages or at separate times.

PROBLEM 1. The student is required to prepare the boat for cruising.

**SCORE:** For correctly checking the boat for the required equipment aboard for daytime operation (lights are not required for daytime operation, but if they are board as standard equipment, score for testing them for operation)—
1 to 20 points _____

**SCORE:** For correctly checking bilges, hull, etc.; bailing or pumping if necessary; checking anchor and anchor line; inspecting for leaks in fuel lines; checking the amount of fuel aboard—
1 to 20 points _____

**SCORE:** For demonstrating and explaining the proper fueling methods; directing the loading of two passengers (or more if the boat is large enough) and trimming for proper balance—
1 to 20 points _____

**SCORE:** For taking the boat out to a designated area nearby and correctly approaching to anchor according to wind and current, anchoring, and retrieving the anchor—
1 to 20 points _____

**SCORE:** For correctly approaching a dock according to the wind or current; properly tying up and discharging passengers; rechecking the boat for damage and the proper stowage of gear—
1 to 20 points _____

A total of 70 points is required for a passing grade.

**NOTE:** The balance of the session depends on your available time. If time is short, skip over the anchor descriptions and concentrate on the *method* of anchoring. Otherwise present all the subjects. Refer to the *Sea Exploring Manual* for illustrations of anchors.

## THE YACHTMAN'S ANCHOR

The old-fashioned or yachtman's anchor has been tested over centuries and found to hold well. (If possible, use a blackboard to illustrate the parts of an old-fashioned anchor or, better yet, have one to display. Compare the parts with those of other anchors.)

## THE NAVY ANCHOR

The Navy or stockless anchor is the popular one seen on the bows of modern freighters and other ships. It is made in many sizes, even for small boats. It depends a great deal on weight for its holding power.

## THE DANFORTH ANCHOR

The Danforth is a lightweight anchor with flat metal flukes that dig into the bottom quickly and deeply. In

place of the stock through the head, it has a round iron rod through the crown, which prevents it from rolling. It stows easily on deck, as it will lay flat.

## THE NORTHILL ANCHOR

The Northill is another lightweight metal anchor. It has a stock at the crown instead of the ring end. This adds to the holding power. These arms fold flat for easy stowing.

## THE MUSHROOM ANCHOR

The mushroom anchor is used for permanent moorings. When used with a buoy, it makes a fine tie up place for boats when it is impractical to bring them to shore. It sinks in the bottom and forms a suction and is extremely good in soft bottoms.

## THE GRAPNEL

The grapnel is used primarily in weedy or rocky bottoms. Its fine prongs become secure in these locations. It is difficult to stow, and, unless locker space is available, it is quite dangerous on deck.

## THE ANCHOR LINE

The anchor line or anchor rode as it is known on small boats is usually manila or nylon rope. Nylon has spring and elasticity and is impervious to rot and mildew. Ropes are easier to handle than chain or wire rope.

Short pieces of chain are sometimes shackled to an anchor to provide additional weight at the place where the anchor bites into the bottom.

## SHALLOW WATER AND SCOPE

Shallow water is preferred for anchoring because less scope is required to provide a good bite. The scope (length of anchor line used) should be at least 5 to 8 times the depth of the water. This allows the pull against the anchor to be along the bottom, causing the anchor to set well in the bottom.

## ANCHOR LOWERED CAREFULLY AND MADE FAST

The anchor is never thrown, but is lowered away carefully until the crown touches the bottom. It is then tended until the desired scope is reached, and then made fast while the backward movement of the boat drags the anchor into the bottom. The engine is not secured until it has been determined that the anchor is holding.

## USING CURRENT OR WIND FOR LANDINGS

Wind and current play a great part in landing the boat on a float or dock. The boat is brought below the force of wind or current and headed into it on the approach, and the vessel powered alongside. Use just enough forward drive to properly handle the boat and maneuver into position. Too much speed is hazardous in that the motor may quit and the boat carry too much way for getting ashore at the proper time. A line is taken ashore as soon as the boat is close enough for a crewman to safely step ashore and handle it. Practice will make a person proficient in making good landings.

## TEST

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Hand out slips of paper and ask the students to number from 1 to 10 for the true and false test. When finished, have them exchange papers and mark their answers. The correct answers are circled on this page.

Encourage discussion if time permits.

1. A good seaman ignores the wind and current when landing his boat. **True** **False**

2. All doors, windows, ports, hatches, etc. should be open during fueling. **True** **False**

3. Grounding the filler nozzle against the tank intake prevents static electricity. **True** **False**

4. Always throw the anchor as far from the boat as possible when anchoring. **True** **False**

5. Recommended scope when anchoring is from 5 to 8 times the water depth. **True** **False**

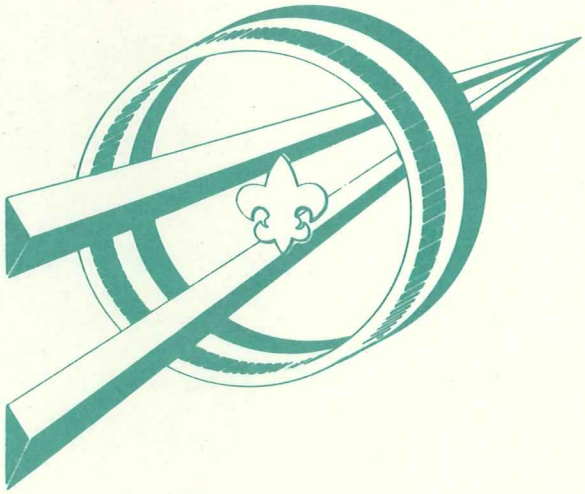
6. The boat should be vented (aired out) for at least 5 minutes after fueling. **True** **False**

The balance of the test is knot tying. Have the students tie one knot at a time and score on their sheets whether it is correct or incorrect.

7. SHEET BEND **Correct_____Incorrect_____**

8. BOWLINE **Correct_____Incorrect_____**

9. CLOVE HITCH **Correct_____Incorrect_____**

10. TWO HALF HITCHES **Correct_____Incorrect_____**

(In order to pass, the student must have seven correct answers.)