

NO TEST ANSWERS!!!
PENNSYLVANIA FISH & BOAT COMMISSION'S



PA BASIC BOATING COURSE INSTRUCTOR'S MANUAL

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SECTION I

PROGRAM INFORMATION

ABOUT THE PENNSYLVANIA BASIC BOATING COURSE

The Pennsylvania Basic Boating Course is an introductory course in boating and water safety. It is eight hours in length and designed to provide the boater with very basic information. Because it is only an introduction, instructors should recommend that students continue their education with the U.S. Coast Guard Auxiliary or the U.S. Power Squadron. The outline for the course follows a logical progression, and instructors are advised to follow the outline when teaching the course.

It is recommended that whenever possible the course be taught in multiple lessons over a period of time. This will allow students ample time to complete reading assignments and review for the final exam. Experience has demonstrated that teaching the course in one day is very difficult for the instructor and the students. This is a classroom only course with no on-the-water activities.

The Pennsylvania Basic Boating Course is a course that entire families can attend. The family can work on the assignments together outside of class, and parents will be able to help their children with the course. In addition, adults in the classroom reduce the possibility of disciplinary problems. The instructor should realize that young children might not be able to handle the material presented in this course.

The use of videos is an important part of this course. **Videos as outlined in the lesson plan must be used by the instructor(s) where indicated.**

PENNSYLVANIA BASIC BOATING COURSE GOALS

The goals of the program are to:

1. reduce the number of boating related accidents and fatalities.
2. promote boating and water safety education.
3. promote recreational boating enjoyment through safe boating knowledge and practices.
4. instruct students in proper procedures used in recreational boating.
5. instruct students on basic safety, rescue, and survival procedures.

COURSE DESIGN

The Basic Boating lesson plan contains six chapters. Each chapter provides the instructor with the following information:

- Topics of lesson/time requirements
- Goals
- Learning objectives
- Materials/equipment
- Content/teaching methods
- Test Questions--information directly relating to questions on the course exam is indicated by a **bold TQ** at the end of a sentence or section.

SETTING UP A COURSE

One of the biggest advantages an instructor has in teaching the Pennsylvania Basic Boating Course is flexibility. The course can be taught at any location convenient to the instructor.

Location - The instructor is responsible for the course from beginning to end. It is best if the instructor can develop a working relationship with the people at the facility where the course will be taught. There are numerous facilities available in all communities which are interested in providing programs, such as: recreation centers, fire halls, marinas, outdoor clubs, boat dealers, high school adult education courses, libraries, churches, as well as numerous community organizations.

Co-sponsors - Having a service or educational organization co-sponsor the course is an excellent way to obtain a facility, advertising, and program support. Before committing to a facility, the instructor should visit the site to determine if it will meet the needs of the class and provide a quality learning environment. Instructor's having problems locating an appropriate location should contact their Regional Outreach and Education Coordinator (ROEC) or the Bureau of Policy, Planning & Communications in Harrisburg for assistance.

Timing - The course can be taught in any month of the year but should be set up well in advance of the first class so course materials can be requested and news releases or advertising can be completed on a timely basis. A minimum of three weeks' notice is recommended because of lag time in media publications and paper flow. Spring and early summer are usually the times of greatest public interest. Schedule to reduce or avoid conflicts. For example, scheduling a class on the opening day of trout season, or on the 4th of July is usually going to affect attendance.

Advertising- The Commission has blank course posters that instructors may use to advertise their courses. They may be requested on the Requisition for Boating Publications form (attached). The Commission will also assist with news releases for PA Basic Boating courses. Instructors should contact the appropriate Regional Outreach and Education Coordinator (ROEC) for assistance with course advertising. Instructors that charge for the course may not use the Commission as a sponsor in their advertising. Charging instructors may only say that the course results in "state certification."

COURSE REGISTRATION

One member of the teaching team should be assigned the responsibility of taking registration prior to the class. Facility staff may also take registration. There should be a firm deadline. When possible, it is important to register students for the course prior to the first class to avoid the problem of "walk-in registrations." This may result in many more students showing up than the facility can handle. Conversely, it is not a good idea to go to the effort to hold a class for less than ten students. Textbooks should be sent to the students before the first classroom session. This will give them time to read the course materials.

Registration prior to the class will also help the instructor solve potential problems that may develop during the class. All students should be told the exact dates and times of the course at pre-registration. Students should never be waiting at the course site before or after classes. At least one instructor must stay at the course site until all students have left. The instructor should not leave students unsupervised at any time.

COURSE REPORTING

The Instructor should report all Pennsylvania Basic Boating Courses to the Commission's Bureau of Policy, Planning & Communications. Instructors need to report all boating courses using the online *Boating Course Scheduling Form* that can be accessed through the Commission's website. The form can be accessed via this link: http://www.fish.state.pa.us/promo/form/boating_courses.htm. By providing this information, it is possible for the Commission to advertise your class on the internet and assist in filling those empty slots on your class roster.

CLASS SIZE AND TEAM TEACHING

Class size should be between 10 and 40 students. Instructors who teach a large number of students in one course should have at least one co-instructor to assist. Again, teaching this course to fewer than ten students is less than ideal.

Team teaching is strongly recommended for the Pennsylvania Basic Boating Course. It enables a group of instructors to provide a variety of teaching methods and better hold the interest of the students. In addition, by working as a team, instructors not actively teaching can deal with any problems that occur in the classroom. Additional instructors can remind the teaching instructor of any topics that he/she may have overlooked, and can key off what the other person is saying to give additional information.

COURSE CONTENT

A minimum of eight (8) hours instruction time is required for student certification. This includes formal classroom instruction, demonstrations, and the final examination. The content of the Pennsylvania Basic Boating Course includes discussion of all topics in the textbook. Films, videos, and publications can be excellent sources of supplemental information to classroom discussion; however, they should not be used to replace actual instruction. Audio-visual aids used in classes must be approved in advance by the Pennsylvania Fish and Boat Commission, Bureau of Policy, Planning & Communications. The Bureau of Policy, Planning & Communications has a variety of publications available to use as aids in classroom instruction. Publications and audio-visual aids are only available upon written request (forms attached).

FORMS

Many of the forms are changed on a regular basis to provide you with the most up-to-date information. They can be downloaded from the Commission website at www.fish.state.pa.us. The most current versions of all forms mentioned are included in this manual.

STUDENT REQUIREMENTS

To be eligible to apply for a Boating Safety Education Certificate, the student must:

1. Attend all parts of the entire course (all chapters).
2. Pass the final examination with a minimum grade of 80%. (maximum 10 incorrect answers)
3. Send a check or money order for \$10.00 with the application received at the end of the course to the Commission in the envelope attached to the application. Students sending applications to the Commission with no check or money order, a check or money order for any amount other than \$10.00, or an application that does not contain the instructor's signature and instructor number will not receive a certificate.

NOTE: Students who do not attend all parts of the course, or who are disruptive in class, should be terminated at the earliest convenient time.

COURSE DOCUMENTATION

1. Examination

- a. The PA Basic Boating Course examination consists of fifty multiple-choice questions and will be given at the end of the course (attached).
- b. All answers will be written on the Application for Boating Safety Certificate. (Available on written request – use the Requisition for Boating Publications form). No marks should be made on the examination.
- c. Students should only use #2 pencils so they can make corrections.
- d. An Instructor's Answer Key is provided so instructors can grade the student test (attached).
- e. Students with reading problems may have the test read to them at their request. This option should be explained well in advance of starting the testing procedure to allow for preparation.
- f. The instructor is responsible for maintaining exam integrity. Take special care to prevent exam fraud by monitoring the test and separating possible problem students.
- g. Upon completion of the exam, each student's Application for Boating Safety Certificate is to be collected and graded by the instructor. Students are advised by the instructor of their grade. Instructors should use discretion in this process. People who fail the exam will often be upset.

2. Application for Boating Safety Education Certification

- a. After grading the answer sheet part of the application, the instructor prints his/her name, instructor number (assigned by the Commission in Harrisburg) and signs each sheet of the application form, and returns the application to the students. The instructor must NOT allow the student to retain the completed answer sheet of the application form or any blank Application for Boating Safety Education Certificate forms.
- b. The instructor is responsible to make certain that the Application for Boating Safety Education Certificate forms are properly completed and legible. The students will then submit via mail the application and certificate fee to the Bureau of Planning, Policy & Communications at the Commission's headquarters in Harrisburg using the provided envelope. Instructors should NEVER collect the certificate fee from the student. It is the student's responsibility to submit the application and fee.
- c. Students should be advised to mail completed applications immediately after the completion of the course to avoid a delay in receiving their certificates.
- d. The applications are data entered in Harrisburg. Students will receive a Boating Safety Education Certificate in the mail (approximately 30 days after receipt in Harrisburg).

3. Boating Education Course Summary Sheet (attached)

- a. Both sides A and B must be completed by the head-instructor for the course.
- b. The Summary Sheet must be mailed to the Bureau of Policy, Planning & Communications in Harrisburg. This documents the course and results in instructors maintaining their certification.

NOTE: The answer sheet part of the Application for Boating Safety Education Certification is not to be mailed to Harrisburg. It is to be retained as part of the instructor's record and must not be returned to the student.

- c. Instructor numbers for all Commission certified instructors teaching any part of the course must be listed.
- d. Student names must be listed in the spaces provided on the back of the form. Use additional copies of the form for large classes.

- e. Summary sheets are used to cross-reference applications received by students.
4. **Student Course Evaluation Form** (attached). Instructors may choose to have each student fill out a Student Course Evaluation Form at the end of the course. Instructors should review the forms to determine if there are any problems with the course or their presentation. The evaluations have helped instructors improve their presentations. In addition, several changes have been made to Commission courses based on student comments. The Evaluations are for your information only. Do NOT send them to anyone in the Commission.
5. **Temporary Boating Safety Certificates** (attached)
 - a. Some students in your class may need certification to operate a personal watercraft (PWC), a motorboat of 26 horsepower or more in Pennsylvania, or a boat in a state that has mandatory boating education requirements. Pennsylvania certification is recognized by all states.
 - b. If there is a student in the class who needs a certificate to go boating before he/she receives certification from the Commission, the instructor may issue a Temporary Boating Safety Certificate to those students who successfully pass the examination.
 - c. The Temporary Boating Safety Certificate is good for 60 days from the date of issue. It is not necessary for the instructor to keep a copy, or to send a copy to the Commission. Do NOT issue temporary certificates to all students, just those described in 5a.
6. **Certification Supplies** - Applications for Boating Safety Certificates, the Boating Education Course Cover Sheet, #2 pencils, Temporary Boating Safety Certificates, Student Course Evaluations, PA Boating Handbooks and all other mentioned supplies and forms are available from the PA Fish and Boat Commission's Bureau of Policy, Planning & Communications upon written request. Use the Requisition for Boating Publications form (attached).

Note: Many of the forms are changed on a regular basis to provide you with the most up-to-date information. They can be downloaded from the Commission website at www.fish.state.pa.us. The most current versions of all forms mentioned are included in this manual.

INSTRUCTOR CODE OF CONDUCT

Instructors represent the PA Fish & Boat Commission when teaching this course. As an instructor in the PA Basic Boating Course, no person may:

1. Deliberately make false statements or any other comments that would degrade the boating safety education program, the PA Fish & Boat Commission, or the Commonwealth of Pennsylvania; or
2. Deliberately conduct themselves in any manner that will bring discredit to the Boating Safety Education Program, the PA Fish & Boat Commission, or the Commonwealth of Pennsylvania (Example: making an inappropriate remark about another instructor or student); or
3. Deliberately perform any demonstration or act in a manner that would place any student in an unsafe situation whether the demonstration resulted in injury or not (Example: immersing a student's hand in ice water for an extended period or allowing a student to enter the water without a PFD).

Failure to conform to the Instructor's code of conduct while participating as an instructor in a PA Basic Boating Course could result in the Commission revoking your certification as an instructor.

COURSE TEXTBOOK

The course textbook is the PA Boating Handbook. The PA Fish & Boat Commission will supply the Handbook free of charge to certified Boating and Water Safety Awareness Course instructors for use in their classes.

INSTRUCTOR REWARDS PROGRAM

The Instructor Rewards Program (IRP) gives an opportunity for instructors to earn prizes by teaching courses. Overall, this is a rewards program for instructors who use the PFBC boating course material.

CHECKLIST AND TIPS FOR INSTRUCTORS

The following checklist will help make sure your class goes smoothly.

- ✓ Double-check the time and location of the class.
- ✓ Complete and mail the Boating Course Report Card at least three weeks prior to your class.
- ✓ Requisition all the boating publications (handbooks, certificate applications, handouts, etc) and videos you will need for the class at least three weeks in advance.
- ✓ Check to make sure you have all the necessary materials, equipment, and instructional aids and make sure they are in good working order.
- ✓ Make arrangements for the audio-visual equipment.
- ✓ Check the classroom for equipment, heating and lighting.
- ✓ Eliminate any distracting influences in the classroom or the boating area.
- ✓ Get the help of co-instructor (See the section on class size and team teaching).

COMMUNICATIONS

Instructors often need to communicate with Commission staff. This includes the Bureau of Policy, Planning & Communications' Regional Outreach and Education Coordinators (ROECs) and the Bureau office in Harrisburg. Instructors also may want to coordinate their course with Waterways Conservation Officers in the Bureau of Law Enforcement. The following listing provides information for instructors to contact the appropriate office.

Bureau of Policy, Planning & Communications: P.O. Box 67000, Harrisburg, PA 17106-7000; (717) 705-7833;

FAX: 705-7831; Commission World Wide Web: www.fishandboat.com; E-mail: ra-be@state.pa.us

Regional Outreach and Education Coordinators:

- **Northwest - 814-336-2426**, FAX 337-0579; Butler, Clarion, Crawford, Erie, Forest, Lawrence, Mercer, Venango, Warren
- **Southwest - 814-443-9841**, FAX 445-3497; Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington, Westmoreland
- **Central - 814-359-5193**, FAX 359-5153; Adams, Bedford, Blair, Cameron, Centre, Clearfield, Clinton, Cumberland, Dauphin, Elk, Franklin, Fulton, Huntingdon, Jefferson, Juniata, Lebanon, Lycoming, McKean, Mifflin, Montour, Northumberland, Perry, Potter, Snyder, Tioga, Union, York
- **Northeast - 570-477-2206**, FAX 477-3221: Bradford, Carbon, Columbia, Lackawanna, Luzerne, Monroe, Pike, Sullivan, Susquehanna, Wayne, Wyoming
- **Southeast - 717-626-9081**, FAX 626-0486; Berks, Bucks, Chester, Delaware, Lancaster, Lehigh, Montgomery, Northampton, Philadelphia, Schuylkill

Bureau of Law Enforcement Regional Offices:

- **Northwest (814) 337-0444; FAX 337-0579**
- **Southwest (814) 445-8974; FAX 445-3497**
- **Northcentral (814) 359-5250; FAX 359-5254**
- **Southcentral (717) 486-7087; FAX 486-8227**
- **Northeast (570) 477-5717; FAX 477-3221**
- **Southeast (717) 626-0228; FAX 626-0486**

SECTION II

TEACHING TECHNIQUES

This section is designed to assist those with little or no formal training in teaching, training or education. It includes some of the basic concepts instructors must consider, understand and apply to be effective. This information is important, whether you've taught before, or taught 100 programs. As the saying goes... *Talking ain't teaching, and listening ain't learning.*

ENVIRONMENT

The learning process is affected by whatever surrounds the student, whether it is good or bad. In order for the student to learn, the environment they are in must be positive. Factors to consider when preparing to teach a class include:

1. Time of day (best time is morning; worst is right after lunch and late in the evening).
2. Location of class (easy to find or well known facilities are best).
3. Size of class (10 to 20 students is ideal).
4. Interruptions or distractions (noise, weather, movement of people or objects).

THE LEARNER

Creating the best learning situation requires the instructor to realize that students vary in individual characteristics. Students will differ in the following areas:

1. **Health and fitness** - Be alert to illness or fatigue.
2. **Physical development** - Some skills may be beyond the physical ability of some students (i.e. elderly or very young lifting equipment).
3. **Intellectual development** - The instructor may have to simplify and explain certain information to a student who learns at a low level. See the section information on the developmental needs of young people.
4. **Personality** - Emotional state, attention span, and attitude all affect learning.
5. **Learning styles** - People learn best in different ways, i.e., hands on, hearing, and visual learning. Incorporate all styles when teaching.

INSTRUCTOR CHARACTERISTICS

The instructor's responsibility is to do everything possible to enhance the learning experience, making it as easy and enjoyable as possible. Fostering an informal atmosphere has been found to be best for teaching boating courses. The effectiveness of an instructor depends on the instructor possessing certain personal characteristics, which will make the learning experience more valuable to the students as well as making them as comfortable as possible.

1. **Personal characteristics**
 - a. Enthusiasm - Assume an upbeat attitude.
 - b. Leadership - The instructor is the role model and in charge.
 - c. Attitude - Maintain a professional attitude. Treat everyone fairly. If possible, learn their names and be patient.
 - d. Accept other people's values. Learn new information.
 - e. Personal appearance - Dress neatly and appropriately. Wear your uniform (if you have one). If this is not applicable, dress a step "up" from your students. Be on time.
2. **Responsible management** (Do NOT assume anything)
 - a. Class management

- b. Check lighting, ventilation and temperature.
- c. Make sure the instructor will be close enough to students to maintain good eye contact.
- d. Check the teaching aids to be used in the class. Ensure the visual aids are the right size for the room and are placed where all the students can see them. Set up all equipment before class. Make sure it is ready. Do not forget extra bulbs.
- e. When appropriate, set aside a section of the room for group practice.
- f. Do not hold class outside unless it is the only location available.

3. Supervision

- a. Plan the course with the Pennsylvania Fish and Boat Commission. Let the Bureau of Policy, Planning & Communications know when and where your courses are scheduled by sending in your course information early.
- b. Administer the course. Make sure all material is covered. Guest speakers for certain subjects may be appropriate, but their conduct is the responsibility of the instructor.
- c. Use the Boating Course Evaluation Form to evaluate the course.

SUGGESTIONS FOR EFFECTIVE COMMUNICATION

Communication is the act of transferring information between two or more people. Effective communication is the backbone of good instruction. To communicate effectively, an instructor should put the following into practice:

1. Establish and hold the attention of the entire group at the beginning of the first class.
2. Define clearly what the students can expect to get from the course. Explain what will be happening during the session, what will be discussed, what they will learn, and when the class will have breaks.
3. Involve all class members in the discussion, but keep it under control. Do not let one student dominate the conversation.
4. Give instructions in a conversational tone and keep them simple.
5. Limit instructions to as many as the students can handle at one time.
6. Relate the subject matter to common or universal experiences, but do not overdo "warstories."
7. Learn to think while "standing on your feet."
8. Use words everyone knows. Define new words in a class discussion. Write the key points in advance or write them on a large sheet of paper and post it in the classroom, referring to it when needed.
9. Do not read to the students unless you need to quote something to them.
10. Avoid annoying verbal and nonverbal distractions (i.e., jingling change, constant swaying, and verbal fillers such as "umms" and "you know").

VOICE

One of the best teaching tools is the instructor's voice. Regardless of its quality, there are many ways the instructor's voice can be used to its best advantage.

1. **Volume** - Talk loud enough so all students can hear. A microphone should be used if the instructor's voice tends to be soft or there is a large group.
2. **Delivery** - Vary the rate of the delivery according to the difficulty of the subject and the learning ability of the students. Avoid speaking in a monotone.
3. **Pronunciation** - Pronounce or accent each syllable clearly and distinctly. Pauses and raising and lowering the voice in much the same way we use punctuation in writing are effective techniques. Be especially careful to pronounce boating terms properly to protect your credibility as the instructor.

4. **Conversation** - Instructors should realize they are not making a speech or preaching. Instructors are talking with, not at, the students. Everyone should be involved in the discussion. Try not to talk longer than fifteen minutes without involving the students in some manner.
5. **Clarity** - Stay away from expressions such as "always," "never," "I say." Instead, cite legitimate, credible authorities to emphasize a point, such as "the textbook states" or "generally." Be as diplomatic as possible.

BODY LANGUAGE

Body language refers to the way the body reveals feeling, intent, values, attitude, belief and motivation through the language of the eyes, facial expression, posture, and gesture.

1. **Student's body language**
 - a. Instructors should be alert to student reactions by letting their eyes travel around the room.
 - b. Include students in the discussion who appear to be tired or bored.
 - c. Direct eye contact may bring an inattentive student back to attention. If eye contact fails, take a step toward the student and direct a question to him/her.
 - d. Check posture. Students slouched down in their seats may not be paying attention. A short break may be helpful.
 - e. Do anything appropriate to hold the students' attention. An inattentive student will not learn.
2. **Instructor's body language**
 - a. Instructors must be aware of their own nonverbal communication.
 - b. Show a willingness to listen by leaning the head or body forward.
 - c. Show friendliness by smiling and making frequent eye contact.
 - d. Refrain from making gestures that may confuse the student or indicate anger or frustration (i.e., clenched fist, frown).

ADDITIONAL STRATEGIES

1. **Climate setting** - Provide the most favorable conditions for learning to facilitate the involvement of individuals in a newly formed group.
 - a. Arrange tables and chairs in a way, which aids learning, and have them ready when students arrive.
 - b. Try to make the students as comfortable as possible. Do not hold classes where students must sit on bleachers, in child-sized chairs or at cafeteria tables.
 - c. Prepare nametags.
2. **Assigning tasks** - Assigning ambiguous tasks is one of the most frequent mistakes of instructors. Instructors should try to involve students in learning with clearly understood instructions so that objectives are accomplished.
 - a. Write out each task before the session (either an individual copy for each student or in large print in front of the whole group).
 - b. Review the task orally.
3. **Bridging** - The art of linking one section of training to the next one.
 - a. Review what has been learned in the prior session.
 - b. Relate what is going to be discussed to what has already been accomplished.
 - c. Training days may be bridged by asking participants to discuss important aspects of what they have already learned and by asking questions about unclear areas.

ABOUT THE PA BASIC BOATING LESSON PLAN

This lesson plan is designed to provide a standardized format for presenting the PA Fish and Boat Commission's PA Basic Boating course. The lesson plan follows a logical progression that will assist the new boater to acquire fundamental safe boating knowledge.

As an instructor, your effective presentation of the material is critical to how much the student learns. The more comfortable you are with the material, the easier it will be to present.

The lesson plan is broken down into six chapters. At the beginning of each, the goal and objectives are identified. A goal is the overall concept of the chapter. Objectives are minimal, measurable, and contain specific concepts or information the student will be able to accomplish.

The chapter's content is presented in an outline format with recommended teaching methods identified above the topic in a gray shaded box. Teaching methods are ways of presenting course material that will enhance the students' comprehension. Varieties of methods are utilized; all are optional. In the lesson plan, information directly relating to questions on the Basic Boating test is indicated by a bold **TQ** at the end of a sentence or section.

A PWC addendum is included at the end of this lesson plan (pages 50-52). This should be used as a supplement to course materials when instructing students who predominantly own or operate personal watercraft.

Videos are a required and necessary part of the PA Basic Boating Course. Of course, audio/visual equipment is required to use videos. A TV, VCR and DVD player (or combination) or a video projector are items instructors need to have available to teach this course. Often the hosting facility will be able to provide audio-visual equipment. Do not rely on the sponsor to provide this equipment unless arrangements have been made in advance.

As an instructor, you are encouraged to develop and create additional teaching methods for presenting the content. All subjects in the lesson plan must be presented, but the method used to present the material is flexible.

A REMINDER: It is the instructor's responsibility to make all students in your course feel as comfortable as possible. The Commission strongly recommends that smoking be prohibited in any Commission sponsored course. Instructors should inform the students of this at the very beginning of the course, as well as the location of the restrooms, exits, and an overview of the course schedule. Also, facilities being used for public boating courses should be handicapped accessible.

CHAPTER ONE

INTRODUCTION

Topics—Teaching Time -- 45 minutes to 1 hour

Course Overview

Boat Operator Responsibilities

Pennsylvania State Boating Waters, PA Fish & Boat Commission

Types of Boats and Nomenclature

Preventive Boat Maintenance

Goal

Teach students that boating on Pennsylvania's many types of waterways requires an understanding of the responsibilities, actions and consequences of boating.

Learning Objectives (Student Performance Objectives)

Students will:

1. Identify the four primary responsibilities of every boat operator.
2. Identify the various types of boating waters in the Commonwealth.
3. Identify the agency responsible for boating and fishing laws in the Commonwealth.
4. Cite the classification of a given boat based upon its size.
5. Identify the parts of a boat on a drawing.
6. Cite the advantages and disadvantages of hull designs (planing or displacement).

Materials/Equipment

Boat America DVD video clips

TV/DVD player and VCR or projector and screen

PA Boating Handbook for each student

Judgment on the Water, A Lesson in Small Boat Safety (optional)

Boating the Starboard Way, Nebraska Game and Parks Commission (optional)

COURSE OVERVIEW

The Pennsylvania Fish and Boat Commission's (PFBC) PA Basic Boating course is an introductory course in boating safety. The eight-hour course is designed to provide the student with basic boating and water safety information. Students are encouraged to continue their education by taking courses offered through the U.S. Coast Guard Auxiliary or the U.S. Power Squadrons. Stay informed of changes in boating safety requirements. To successfully complete the course the student must:

- Attend all sessions of the course (total 8 hours)
- Pass the final examination with a minimum grade of 80% (maximum of 10 incorrect answers).

Students can apply for a Pennsylvania Boating Safety Education Certificate after completing the course with a passing score on the final examination. The certificate will be issued to the student once the Commission receives the application and fee. This certification is recognized by other states that require a National Association of Boating Law Administrators (NASBLA) approved course to operate a boat.

BOAT OPERATOR RESPONSIBILITIES

1. Boat operators are responsible for:
 - a. knowing the rules and regulations for boats in areas where they are boating;
 - b. knowing the safety equipment required for their boat;
 - c. the actions of all persons on board their boat;
 - d. knowing the waters where they are boating.
2. Boaters can protect themselves by taking a safe boating course
 - a. Accidents can be reduced drastically.
 - b. Conflicts among different types of boaters are reduced.

BOATING IN PENNSYLVANIA

Give local examples for each and show on map.

1. 83,261 miles of rivers and streams.
2. 76 natural lakes, which provide 5,266 acres of flat water.
3. 2,300 constructed impoundments provide another 200,000 acres of boatable waters.
4. Lake Erie has 63 miles of shoreline and 735 square miles of water within Pennsylvania's boundaries.
5. Delaware River provides 56 miles of tidal waters within Pennsylvania giving access to the Atlantic Ocean.
6. Pennsylvania state boating statistics:
 - a. In 1982, less than 200,000 boats registered; in 2006, more than 342,000 boats registered.
 - b. Estimated 300,000 non-registered unpowered boats.
 - c. 55% of registered boats are 16 feet or less in length; most boats are small and trailerable.

Show agency patch/logo.

7. Pennsylvania boating regulatory agency responsibilities.
 - a. PA Fish & Boat Commission, P.O. 67000, Harrisburg, PA 17106-7000; Phone (717) 705-7833.

- b. Responsible for promoting, regulating, and enforcing fishing/boating regulations in Pennsylvania.
- c. Established in 1866.
- d. Funded by Pennsylvania's boaters and fishermen through separate boat and fish funds (boat registration fees and fishing license revenues).
- e. PA Fish and Boat Commission often confused with the PA Game Commission, Department of Conservation and Natural Resources, Bureau of State Parks or Bureau of Forestry; these agencies work together.

Video: "Judgment On The Water. A Lesson In Small Boat Safety" (24:00) or "Boating the Starboard Way" (29:00)

TYPES OF BOATS AND NOMENCLATURE

BH chapter 1, pg. 6

**BA DVD Clip: Ch. 1: Boat Length (:10),
Ch. 1: Hull Types (:56)**

Poll students about their boating activities.

1. Types/Classification
 - a. Recreational boats range from personal watercraft, motorboats, sailboats, windsurfers, rowboats, canoes, kayaks, pontoon boats, inflatable boats and others.
 - b. Boats are classified according to their length, which is the horizontal distance from bow to stern along the center line, excluding anything attached with clamps, screws or bolts.
 - c. Boat classification determines the minimum legal requirements:
 - i. Less than 16 feet: Boats in this class are trailerable or able to be car-topped; includes johnboats, personal watercraft, etc.; represents the greatest number of boats.
 - ii. 16 feet but less than 26 feet: These boats can also be trailered; boats in this category are typically used for skiing, fishing, and day tripping; they may have enclosed cabins.
 - iii. 26 to less than 40 feet: Large boats that usually include enclosed cabins with a lot of the conveniences of home.
 - iv. 40 feet to not more than 65 feet: Large, expensive boats with advanced features and comforts.

BA DVD Clip: Motor Types (1:16)

BH chapter 1, pg. 4-5

Discuss advantages and disadvantages of each type of motor

2. Different types of motors
 - a. Outboard - vary greatly in size, clamp onto transom, whole motor pivots on its mounting to aim the wash and steer the boat, boat turns in opposite direction tiller arm is pushed. Electric motors are outboards.
 - b. Inboard/Outboard (I/O) - bolted inboard at the stern with the drive unit through the transom.
 - c. Inboard - mounted lower in boat and further forward than I/O, rudder used to steer.
 - d. Jet - engine pumps water through a nozzle at the stern, which pivots to steer the boat.
 - e. Certain lakes in the state require specific size limitations (ex. under 10 horsepower).
3. Boat hull types
 - a. Planing (flat bottom) - skims across the water, best on calm water.
 - b. Displacement (round bottom) - plows through water not on top of it, slower but more stable than planing.

- c. Most boats are a compromise between planing and displacement hulls; deep-V, modified-V, cathedral, etc.
- d. Multiple hulls boats - catamarans and pontoons.

BA DVD Clip: Ch. 1: Boat Nautical Terms (:14) Ch. 1: PWC Nautical Terms (:29)
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4. Boat terminology

BH chapter 1, pg. 5

- a. Hull - the structural body of the boat that does not include the superstructure, masts or rigging.
- b. Bow - the forward part of a boat.
- c. Forward - aboard a boat, the direction to the front, to the bow.
- d. Aft - Near or at the stern of the boat.
- e. Stern - the after (back or rear) portion of the boat.
- f. Port - left side of the boat.
- g. Starboard - right side of the boat.
- h. Transom - the transverse part of the stern (where an outboard motor is attached).
- i. Keel - the main structural member of a boat, its backbone, the lateral area beneath the hull, which helps to provide stability & reduce the sideways drift of a boat.
- j. Freeboard - the vertical distance from the waterline to the gunwale.
- k. Draft - the vertical distance from the waterline to the lowest point of the keel, the minimum depth of water in which a vessel will float.
- l. Beam - the width of a boat, also the direction at right angles to the centerline of a vessel.
- m. Gunwale - the upper edge of the side of a boat.
- n. Bilge - lowest point of a boat's interior hull.
- o. Waterline - intersection of a boat's hull and the water's surface.

PREVENTIVE BOAT MAINTENANCE

BH chapter 3, pg. 20-21

- 1. Many possible problems your boat may have can be prevented by regular maintenance.
- 2. Regularly inspect and maintain everything in your boat such as:
 - a. Onboard safety equipment. (PFDs, fire extinguishers, bailers, anchors, etc.)
 - b. Motor, fuel, and electrical systems.
 - c. Through-hull fittings and accessory attachments.

CHAPTER TWO

LEGAL REQUIREMENTS -- STATE AND FEDERAL

Topics—Teaching Time -- 2 to 2.5 hours

Boat identification

Capacity plates

Personal Flotation Devices

Visual and Sound Requirements

Fire Prevention

Recommended Equipment

Environmental

Boating Accidents

Goal

Boaters will learn what is needed to meet the **minimum** legal requirements for the type and size of craft they operate, and what additional safety equipment beyond the minimum legal requirements is highly recommended.

Learning Objectives (Student Performance Objectives)

Students will:

1. Cite the requirements for numbering, registering and titling boats.
2. Describe four ways to prevent boat theft.
3. Identify the information found on a capacity plate.
4. Cite carriage requirements in PA for PFDs.
5. Identify the minimum sound-producing device for all boats 40 feet or less.
6. Identify the legal requirements for visual distress signals (VDS) and where they are required.
7. Explain why boats are ventilated and know minimum amount of time blowers are to be used.
8. Identify why a flame arrestor is required, where it is located, and how it is cleaned.
9. Identify the size and letter of a USCG approved fire extinguisher for a given sized boat.
10. Describe the P.A.S.S. method for extinguishing a fire.
11. Describe the importance of muffling devices.
12. Cite the device installed on toilet systems that prevent the release of sewage.
13. List five safety items a boater should carry that are not required by law.

Materials/Equipment

Boat America DVD video clips

TV/DVD player and VCR or projector and screen

PA Boating Handbook for each student

Validation decal, capacity plate, types of PFDs, non-serviceable PFD, personalized PFD, whistle or air horn, visual distress signals (inert), flame arrestor, piece of window screen, lighter, fire extinguisher, Recap of Boating Accident Fatalities report, Commission "Fishing and Boating Map."

BOAT IDENTIFICATION

BH chapter 2, pg. 11-13

1. Numbering of vessels
 - a. Boats propelled by machinery and operated on navigable waters must be numbered, regardless of length and type of motor.
 - b. Boats excluded include documented vessels such as yachts, public vessels, ship's lifeboats, and vessels with a valid temporary certificate.
 - c. Boats must be numbered in state of principal use; mutual privileges are granted to boats registered in other states for 60 days or less.
 - d. Numbers must be painted or permanently attached to each side on the forward half of the vessel; no other number may be displayed.
 - e. Numbers must read from left to right, of block character, and in contrasting color to the background and not less than 3 inches in height.
 - f. Between the prefix, the numerals, and the suffix, there must be a hyphen or space equal to the width of any letter or number except "I" or "1."
 - g. Numbers may not be obscured, must be as nearly vertical as possible and easily observed.
 - h. Boat numbers and certificates of registration are not transferable from boat to boat.
2. Boat registration and launch permits
 - a. All motorboats operated on Pennsylvania waters must be registered. **TQ#1**
 - b. Two-year fee for boats less than 16 ft. is \$26; 16 ft. to less than 20 ft. is \$39; 20 ft. or more is \$52; voluntary registration of unpowered boats is \$18. **Existing** boat registrations can be renewed online (www.fish.state.pa.us).
 - c. Exception for manufacturers and dealers - \$15.00 per year.
 - d. Expires on March 31

Show validation decal

Emphasize advantages of boat registration versus a launch permit. Refer to application for launch permit in BH or online at the Commission's site.

- e. Color-coded registration validation decals must be displayed within 6 inches of the boat number on the same level (before or following the number). The decals are numbered and a sticker with the same number must be attached to the registration card.
 - f. Launch permits for **unpowered boats** that are not registered (only) must be displayed on either side of an amidships (in the middle of the boat) just below the gunwale. Launch permits cost \$10 for one-year; \$18 for two years. Launch permits are also available from DCNR, State Parks. They can be purchased from the Commission online.
 - g. All boats (powered or unpowered) using PFBC lakes or accesses must be currently registered (currently registered out-of-state boats may use PFBC accesses or lakes) or display a launch permit decal. The Commission does **NOT** recognize launch permits from other states.
 - h. Registered boats must be numbered. Exceptions to numbering: kayaks, sculls, sailboards, and documented vessels. All registered boats must display registration decal.
 - i. Documented vessels (yachts) used for recreational purposes must be registered.
3. Boat titling
 - a. A certificate of title is a legal document proving ownership.
 - b. Boat titling is required for all inboard motorboats with a model year of 1997 or newer (including personal watercraft) and all outboard motorboats 14 feet or more in length with a model year of 1997 or newer.

- c. All other boats, regardless of the length, power source or year of the boat, may also be titled, but it is not mandatory to do so.
 - d. Fee for issuance of title is \$15.
 - i. Additional encumbrance fee of \$5 if there is a lien against boat.
 - ii. \$5 fee for duplicate title.
 - e. Advantages to titling
 - i. Assures buyer of a boat that seller has clear ownership of boat offered for sale.
 - ii. May be easier to secure a loan.
 - iii. Deterrent to boat theft.
4. Boat theft
- a. Small powered and unpowered craft and outboard motors are vulnerable.
 - b. Registered and titled boats less likely to be stolen and more likely to be recovered due to ease of identification.
 - c. Theft prevention checklist
 - i. Secure it - store boat in motor in a secure location. Use a hitch lock to secure boat trailer. Lock outboard motor to boat.
 - ii. Mark it - use an engraving tool to mark boat, motor, and equipment with a unique ID.
 - iii. Record it - keep a record of boat and motor's make, model, and serial numbers.
 - iv. Report it - immediately report any theft to police and to the PFBC, (866-262-8734).
5. Hull identification number (HIN)
- a. Federally required.
 - b. Located on or near the transom's upper starboard side plus one hidden on vessel.
 - c. 12 characters in length; newer boats - 17 characters in length.

BH chapter 2, pg. 14

BA DVD Clip: Ch. 2: Boat Capacity (:49)	BH chapter 2, pg. 14
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Show an actual plate, have the students ID the type of boat. Explain that any violation for carrying capacity is unsafe and illegal.

CAPACITY

PLATES

1. Permanently affixed to every monohull boat (boat with one hull) less than 20 feet in length designed to carry two or more persons, propelled by machinery or oars as its source of power if the boat is manufactured, transferred, sold, or offered for sale.
2. Pennsylvania requirements
 - a. Any boat (as described in part 1 of this section) operated upon Commonwealth waters must have a capacity plate.
 - b. Plates are issued by the PFBC (if manufacturer's plate is not available). Fee-\$5.
 - c. Boats excluded are pontoon boats, canoes, kayaks, sailboats, inflatables, windsurfers, personal watercraft, hydroplanes, and boats of unique design.
 - d. Must be located at a position where the operator can see it while operating the boat.
 - e. Information required. (Some plates issued by manufacturers may not have iii. or iv.)
 - i. Maximum weight capacity in pounds. TQ#2
 - ii. Maximum horsepower.
 - iii. Maximum persons capacity in numbers.
 - iv. Maximum persons capacity in pounds.

BA DVD Clips: Ch. 4: PFDs (3:22),
Ch. 5: Wearing PFDs (:45)

“Fashion show” – Have students model various types. Show all types if possible. Discuss inflatable PFDs.

1. Types of Personal Flotation Devices (PFDs, life preservers, jackets or vests)
 - I - Offshore life jacket - Over 20 lbs. of buoyancy, designed to turn unconscious person face up.
 - II - Near shore buoyant vest - Minimum 15.5 lbs. of buoyancy, designed to turn unconscious person face up.
 - III - Flotation aid - Minimum 15.5 lbs. of buoyancy, not designed to turn an unconscious person face up; more comfortable for water sports.
 - IV - Throwable device - Minimum 16.5 lbs. of buoyancy, designed to be grasped not worn.
 - V - Special use device - Must be worn for accepted use to be legal; label gives uses and limitations; includes boardsailing, work vests, and whitewater PFDs.
2. Legal requirements
 - a. All boats must have a USCG approved wearable PFD on board for each person. **TQ#8**
 - b. Boats 16 feet and over (except canoes and kayaks) must have one approved wearable device on board for each person, plus one throwable device. **TQ#7**
 - c. Type V PFDs must be worn for their specific purpose to be acceptable.
 - d. A throwable flotation device (Type IV) can not be used as a substitute for a wearable device (Type I, II, III or V); canoes and kayaks, regardless of length, are not required to carry a throwable device.

Show non-serviceable PFD.

- e. PFDs must be in good and serviceable condition and legibly marked showing USCG approval. Non-serviceable PFDs showing excessive wear, tears, or other damage must be replaced. **TQ#4**
- f. Type I, II, and III PFDs must be "readily accessible" which means easily reached and ready to wear.
- g. Type IV PFDs (throwables) must be "immediately available" meaning within arms reach of the operator or passenger while the boat is being operated.

Demonstrate appropriate sizing

- h. Must be appropriate size for the person intended. **TQ#6**
3. Additional Pennsylvania requirements
 - a. All water skiers and anyone being towed behind vessels, personal watercraft users and passengers and sailboarders must wear a PFD. Inflatable PFDs are not acceptable to meet this requirement. **TQ#5**
 - b. Children 12 years of age and younger must wear an approved Type I, II, III or V PFD while underway on any boat 20 feet or less in length and all canoes and kayaks.

- c. On Pittsburgh District U.S. Army Corps of Engineer lakes (only), PFDs are required to be worn by everyone in boats under 16 feet and on all canoes and kayaks; lakes in PA include: Crooked Creek, Loyalhanna, Conemaugh, Mahoning, Youghiogheny, Tionesta, Kinzua, Woodcock, East Branch and Shenango.

Show personalized unit with knife, whistle, reflective tape, etc.

4. PFD Issues
 - a. PFDs should be personalized, properly fitted, and tested in the water; everyone should know how to use them.
 - b. Extended sunlight may damage. Do not store wet.
 - c. It is highly advisable to wear PFDs at all times, especially in dangerous conditions. PFDs can be extremely difficult to put on once a person is in the water.
 - d. Inflatable life jackets must be checked frequently and maintained according to the manufacturer's recommendations to ensure correct operation when used.

VISUAL AND SOUND REQUIREMENTS **BH chapter 2, pg. 17**

BA DVD Clip: Ch. 4: Signaling Devices (:56)

Show whistle and horn. Emphasize attaching whistle to PFD.

1. Sound producing devices
 - a. Motorboats less than 12 meters in length shall carry some mechanical means of making a sound signal. This device may be hand, mouth or power operated. An athletic coach's whistle is an acceptable sound-producing device for small motorboats.
 - b. Unpowered boat operators are required to have some means of making an efficient oral or mechanical sound signal that can be heard by another boat operator in time to avoid a collision.
 - c. Sound signaling devices must be readily accessible to the operator of the boat.

Show examples but DO NOT use "live units, only use inert samples.

2. Visual distress signals (VDS) **BH chapter 2, pg. 17**
 - a. Requirements
 - i. In Pennsylvania, VDS are only required on Lake Erie. **TQ#11**
 - ii. Must be approved by the U.S. Coast Guard.
 - iii. All recreational boats 16 feet or more in length are required to be equipped with VDS (day and night) when operating on coastal waters (including the Great Lakes).
 - iv. Boats less than 16 feet are required to carry night VDS between sunset and sunrise.
 - v. Open sail boats less than 26 feet without engines, and other unpowered boats are exempted from carrying VDS in the daytime; between sunset and sunrise nighttime VDS are required on all boats.
 - b. Types
 - i. Day use
 - 1) Flag (black circle and square on orange flag).
 - 2) Orange smoke.
 - ii. Day and night use

- 1) Flares - aerial and hand held (3 minimum).
- 2) Expiration date must be stamped on flares; keep outdated flares to use first in an emergency (good for 42 months).
- 3) Best used only when other vessel in sight.
- 4) Short duration.
- 5) Do not hold or set off over boat. **Explain Hazard**
- 6) Aerial flares should be fired downwind; hold hand held over the leeward side.

FIRE PREVENTION

BH chapter 2, pg. 19

BH chapter 5, pg. 36

BA DVD Clips: Ch. 2: Fueling (2:16)
Ch. 4: Fire Extinguishers (:43)
Ch. 5: Fire Emergencies (:45)
Ch. 5: Carbon Monoxide Poisoning (:42)

1. Ventilation
 - a. All motor boats except open boats shall have at least 2 ventilator ducts with cowls - intake and exhaust; exhaust blowers are part of most boats' ventilation systems.
 - b. Open boats are those motorboats constructed with all engine and fuel tank compartments open to the air to prevent entrapment of explosive gases and vapors.
 - c. Permanently installed fuel tanks must be vented.
 - d. Gasoline fumes are denser than air; an explosion could occur if leaking gas vapors collect in the boat's bilge (lowest interior area where gasoline fumes are most likely to accumulate). **TQ#13**
 - e. Keep bilge clean and dry, use nose to sniff bilge.
 - f. Run the blower for at least 4 minutes, prior to starting the engine. **TQ#12**
 - g. Routinely check for leaks in fuel lines and fittings, frayed wiring, and improperly rigged electrical systems.
2. Carbon monoxide gas is another potentially dangerous byproduct of your boat's engine.
 - a. Skiers and swimmers behind a boat can be overcome by carbon monoxide gas on the water, causing them to suffocate and drown.
 - b. Avoid exhaust vents, shut off the engine, and keep air moving through the boat to avoid this problem. **TQ#23**
3. Fueling **TQ#19**
 - a. Most boat fires and explosions occur from improper fueling.
 - b. Do not fill tank to rim; gasoline will expand with increasing temperatures.
 - c. Portable tanks
 - i. Should be filled with gas on the dock or pier, not on board.
 - ii. Close the vent and pump the gas carefully.
 - iii. Nozzle must maintain contact with the tank's rim.
 - iv. Clean up any spills; secure tank in boat; open vent.
 - v. Toxic substances must be disposed of properly. Noncompliance may result in fines.
 - vi. Check the fuel line, clamps, and fittings.
 - d. Inboard tanks
 - i. Send everyone ashore.
 - ii. Close up the boat; shut off electrical systems.
 - iii. After filling up, and before starting the engine, turn on blower for four minutes.
 - iv. Smell for fumes and do not start the engine if fumes are detected.

Show example – demo with screen and lighter.

4. Carburetor backfire flame arrestors
 - a. Reduce the chance of fire on a boat.
 - b. Gasoline engines, except outboards, must have an approved (USCG, SAE, or UL) backfire flame arrestor control on the carburetor to prevent ignition of gasoline vapors in case the engine backfires.
 - c. Clean with hot, soapy water or commercial cleaner.

Show discharged fire extinguisher | BH chapter 5, pg. 36

5. Fire extinguishers
 - a. Requirements
 - i. Must be in good and serviceable condition and USCG approved.
 - ii. Number of units required depends on boat length and construction.
 - iii. Must be maintained in a usable condition (gauges operable, nozzles free of obstructions) and fully charged.
 - iv. Must be installed and immediately available within arms reach of the operator or passengers on the boat.
 - v. Must be carried on all motorboats with:
 - 1) Closed compartments.
 - 2) Permanently installed fuel tanks.
 - 3) Double bottoms not sealed to the hull or completely filled with flotation materials.
 - 4) Closed living spaces.
 - 5) Closed storage compartments in which combustible or flammable materials are stowed.
 - b. Though some boats are not required to have fire extinguishers, they are highly recommended for all boats that use gasoline for fuel.

Give example

Give examples of types of fires. A- ash, B- boil, C - current

- c. Classification determined by letter and number.
 - i. Letter designates type of fire they will put out.
 - 1) "A" Combustible solids
 - 2) "B" Flammable and combustible liquids
 - 3) "C" Electrical fires
 - 4) Multiple use "A/B/C" types are best for boats.
 - ii. Number represents the amount of extinguishing agent.
 - 1) Boats under 26 feet need one B-I.
 - 2) Boats 26 feet and less than 40 feet need at least two B-I's or one B-II.
 - 3) These are "minimum" requirements; boats should carry more or larger units.
- d. Types

TQ#9

- i. Dry chemical - most popular for small boats; portable units are light, inexpensive and require little maintenance; check gauge or indicator for proper charge, and invert and shake to keep chemical from settling.
- ii. Other types: carbon dioxide, freon or halon (being phased out), and foam.
- e. Common violations or mistakes
 - i. Unit discharged.
 - ii. Obstructed nozzle.
 - iii. Left on boat and subjected to summer heat and winter freeze.
 - iv. Unit not mounted, or mounted in wrong place; units should be mounted away from the fuel source in an accessible area

TQ#10

**Note: Fire extinguishers should be inspected regularly.
Demonstration**

BH chapter 5, pg. 36

- 6. In case of fire
 - a. Stop boat, put on PFD.
 - b. Turn off engine, blower, and main electrical switch if possible.
 - c. Use extinguisher immediately; time of discharge is brief.
 - d. Use the P.A.S.S. technique; 4 - 6 feet from the flames.
 - i. **P** - Pull pin
 - ii. **A** - Aim at base of fire
 - iii. **S** - Squeeze handle
 - iv. **S** - Sweep side-to-side, using short bursts, ½ - 1 second each; check the flames after each sweep; watch for flare-ups.
 - e. Know where the unit is, how it is operated, and how to release it from mount.
 - f. Have a plan and be familiar with your equipment.

TQ#42

RECOMMENDED EQUIPMENT not required by law

BH chapter 2, pg. 18

- 1. Alternative means of propulsion (oars-paddles)
- 2. Bailer
- 3. Anchor
- 4. Fenders
- 5. Dock lines
- 6. First aid kit
- 7. Extra clothing, food and water
- 8. Charts and compass
- 9. Marine radio or cellular phone
- 10. Sun screen and sun glasses
- 11. Tool kit

ENVIRONMENTAL

BH chapter 2, pg. 19

- 1. Muffling devices
 - a. Boat motors must be equipped with an efficient muffling system or device in good working order.
 - b. Boat exhaust systems may not be modified in any manner that will reduce or eliminate the effectiveness of the muffler or muffler system.

Hand out “Fishing and Boating Map;” Refer to location of pumpout stations.

2. Marine sanitation device (MSD) **BH chapter 6, pg. 45**
 - a. A sanitation system onboard boats attached to marine toilets to control pollution.
 - b. Must be USCG approved.
 - c. Boats must hold wastes onboard in the MSD and remove them at a pump out station; littering and dumping anything into PA waters is illegal.

3. Pollution **BH chapter 6, pg. 45**
 - a. Unlawful for any person to litter.
 - b. Operator is responsible for all litter originating from his/her boat.
 - c. If something blows out of a boat, go back and remove the object(s) from the water. **TQ#22**
 - d. Properly dispose of all litter. Ex. plastic bags, fishing line, six pack rings (cut them)
 - e. Report water pollution to Dept. of Environmental Protection at 1-800-541-2050 (after hours number 717-787-4343), or the nearest PFBC region law enforcement office. Dead fish are a good clue.
 - f. Boating on Federal waters requires vessels over 26 feet to display a placard in an easy to see location to notify passengers and crew about discharge regulations.

4. Aquatic Nuisance Species **BH chapter 6, pg. 46-47**
 - a. Remove weeds and other “tag along” debris from boat, motor, trailer.
 - b. Wash all boat/motor/trailer surfaces with hot water or high-pressure spray. **TQ #21**
 - c. Drain live wells, bilges, other compartments of all standing water before using a different lake.
 - d. Dispose of all unused baits properly—NOT into the water.

BOATING ACCIDENTS

BH chapter 5, pg. 43

Handout a sample Boating Accident Report.

Read a current PA recap. Caution: Be aware that the victim described in the recap may have friends or family in the class.

1. Pennsylvania requirements
 - a. The operator of any boat involved in a boating accident is required to stop, render assistance, and offer identification if doing so would not endanger their own boat or passengers. **TQ#43**
 - b. If the accident results in a death or disappearance, authorities must be notified immediately, followed by a boating accident report within 48 hours.
 - c. If the accident results in an injury that requires treatment beyond first aid, a Boating Accident Report must be submitted within 48 hours.
 - d. If the accident results in damage to the boat or other property exceeding \$2,000 or there is total loss of a boat, a Boating Accident Report must be submitted within 10 days. **TQ#44**
 - e. In Pennsylvania, boating accidents must be reported to the Fish & Boat Commission. The form for reporting accidents is available online at the Commission’s web site.

2. Types of accidents and contributing factors
 - a. Collisions - most common accident, causes most personal injuries.
 - b. Capsizing - most common fatal accident.
 - i. Caused by overloading and improper loading, sudden and sharp high speed turns, boating in bad weather. **TQ#3**
 - ii. Results in most fatalities.
 - iii. If a capsizing occurs, respond by staying with the craft, putting on PFDs, accounting for passengers, and signaling for assistance.
 - c. Falls overboard - another common fatal accident.
 - i. Often caused by standing up in a boat, riding on gunwale or bow decking. **TQ #36**
 - ii. Second most common type of fatality.
 - iii. If someone falls overboard, respond with rescue sequence Reach, Throw, Row, Go. **TQ#40**
 - iv. Capsizing and falls overboard are the leading cause of boating deaths nationwide. **TQ#37**
 - d. Fires and explosions - Caused by improper fueling (most common cause), improper ventilation, and wiring not properly maintained; severe injuries and property damage. **TQ#19**
 - e. Swamping and flooding - Caused by overloading or improper loading, operating in hazardous waters or under adverse weather conditions.

CHAPTER THREE

OTHER WATER ACTIVITIES

Topics—Teaching Time -- 30 to 45 minutes

Personal Watercraft

Other Activities

Goal

There are many unique types of boats and activities on the water today. Students will learn additional legal and safety requirements that have been established to ensure safe boating conditions on the water.

Learning Objectives (Student Performance Objectives)

Students will:

1. Identify a personal watercraft as a Class A motorboat and list its legal requirements
2. Cite when a personal watercraft can pull a water skier and how many people are required (same requirement for a power boat).
3. Describe when (time) it is legal to water ski or operate a personal watercraft.
4. Cite the swimming regulation for state parks and PFBC facilities.
5. Identify the divers, code flag Alpha, and cite the minimum distance a boat operator must be from these flags.
6. List the three activities when a PFD is required to be worn at all times in Pennsylvania.
7. Discuss why nontraditional boaters have an increased risk of trouble on the water.

Materials/Equipment

Boat America DVD video clips

TV/DVD player and VCR or projector and screen

PA Boating Handbook for each student

Videos: Play It Safe; Judgment on the Water, A Lesson in Small Boat Safety;" clip: "duck hunting."

(**WARNING:** This video clip contains footage of ducks being shot, which may be offensive to non-hunters. If this offends any students, substitute another video selection.)

Aids-to-navigation decal, Recap of Boating Accident Fatalities Report.

PERSONAL WATERCRAFT (PWC)

**BA DVD Clips: Ch. 3: Operating a PWC (5:09),
Ch. 3: Sharing Your PWC (1:26)**

BH chapter 4, pg. 32-33

1. General Information
 - a. Many types; all are less than 16 ft., inboard, powerboats.
 - b. Fast, maneuverable, and powered by jet drives.
 - i. Speeds in stock units of 40 to 65 mph.
 - ii. Propulsion
 - a) Propelled through the water by a jet pump
 - b) Water drawn through the impeller that forces it in a stream through nozzle.
 - c) No propeller - pump intake can be dangerous.
 - d) Don't operate boat in water less than 2 feet in depth. Intake will suck in sand, vegetation, etc. and could damage PWC.
 - e) A cutoff switch attached to a safety lanyard stops the engine when the operator falls off.
 - c. Steering
 - i. Designed to turn quickly.
 - ii. The steerable nozzle at rear of the pump housing is controlled by the handlebars.
 - iii. Steering control directs the stream of water to the left or right.
 - iv. To maneuver quickly, the operator must use the throttle to maintain steering control. Releasing the throttle completely results in total loss of steering control. "When in doubt, power out." **TQ#49**
 - v. Some PWC have reverse - not to be used as a brake - use only at idle speed.
 - d. Requires increased awareness/judgment for safe operation.
 - e. Failure to keep a proper lookout is the reason for most accidents on PWC. Ex: PWC operator turns without looking and collides with overtaking boat.
2. Pennsylvania legal requirements
 - a. Operators of PWC must obey the same rules as other motorboats.
 - b. Everyone on board must wear a PFD. Inflatables are not approved for use on PWCs.
 - c. Illegal to rent to or for the use by a person under 16 years of age or younger.
 - d. Illegal to operate from sunset to sunrise. **TQ#46**
 - e. When supplied with boat, safety lanyard for the kill switch must be attached to the body, clothing, PFD.
 - f. Illegal to tow a water skier behind a PWC with a capacity of two people or less and to tow more than one skier.
 - g. Fire extinguishers, sound producing device, numbers and registration (carry on board) required.
3. Improper operational activities
 - a. Wake jumping. Stay away from other operating boats.
 - b. Fast starts from shore or a dock.
 - c. Operating in the same area all day close to people on shore.
 - d. Operating close to unpowered boaters. Give sailboats, sailboarders, canoeists and kayakers plenty of room. Unpowered boats are not as maneuverable as PWC.
 - e. Operating near swimmers or divers' flags. Keep a sharp lookout for swimmers. Stay at least 100 feet away from the divers' flags.
 - f. Following a water skier or crossing between skier and boat.
4. Minimum age for operation of PWC
 - a. No one 11 years of age or younger may operate a PWC. **TQ#48**

- b. It is illegal for anyone to operate a PWC unless they have in their possession a boating safety education certificate. (Different requirements for other motorboats.)
 - c. Operators 12 through 15 years of age may not operate a PWC with any passengers onboard who are 15 years of age or younger.
5. Environment - wildlife
- a. Personal watercraft have been designed to be "environmentally friendly" when operated in a responsible manner.
 - i. Create less wake than most powerboats, causing less damage to docks and other personal property.
 - ii. Minimizes erosion on the shoreline and waterway bottoms.
 - iii. Jet drives cause less damage to vegetation than a propeller.
 - b. High speed/high rpm operation in very shallow water can cause significant erosion and damage to the craft.
 - c. PWC have a tendency to disturb wildlife with their noise. Steer clear of birds and other animals. Chasing or pursuing wildlife on any boat is illegal and unethical.

OTHER ACTIVITIES

BH chapter 4, pg. 33-35

1. Water Skiing
- a. Skiing includes tubing, knee boarding, and similar activities.
 - b. Beginners should take lessons from experienced individual.
 - c. Requires athletic ability by skier, an experienced boat operator, and a vigilant observer.
 - d. Boat operators should turn off the motor before picking up a skier or swimmer. Putting the motor in neutral is NOT enough. The prop could still be spinning.
 - e. Pennsylvania regulations:
 - i. Anyone being towed behind a boat must wear an approved PFD; ski belts (not Coast Guard approved) and inflatables are not acceptable. **TQ#5**
 - ii. A competent observer must be onboard (and observing) in addition to the operator. **TQ#50**
 - 1) Has the ability to assess when a skier is in trouble
 - 2) Knows and understands the water skiing hand signals
 - 3) Capable of helping a skier.
 - iii. Skiing is prohibited between sunset and sunrise.
 - iv. Towlines may not exceed 80 feet, but must be at least 20 feet in length.
 - v. It is legal to tow more than one skier except where locally prohibited or on PWC.
2. Swimming
- a. Swimming is prohibited at PFBC lakes and access areas.
 - b. Swim areas are often buoyed off; boats must keep out.
 - c. Boat operators should always keep a sharp lookout for swimmers. Swimmers are very hard to see in the water; look for swimmers near anchored, moored and beached boats.
 - d. It is now legal for people to swim from boats at State Park lakes outside of designated swim areas if they are wearing a USCG approved PFD and are in the water near their boats.
3. Diving
- | |
|-----------------------------|
| BH chapter 4, pg. 35 |
|-----------------------------|
- a. A diver down flag is displayed from a float during diving operations - rectangular flag - red with a white diagonal stripe running from the top of the staff to the opposite lower corner. **TQ#47**
 - b. Code flag Alpha - blue and white pennant that boats must display during dive operations if they are restricted in their ability to maneuver.

- c. Boats not engaged in diving operations must remain at least 100 feet from areas displaying the diver's flag, or boats displaying the code flag Alpha.
- 4. Sailboards (Windsurfing)
 - a. Operators must wear a life jacket in Pennsylvania; inflatables are not acceptable.
 - b. Sailboard is a single or double-hulled boat with a jointed mast (surfboard with a sail).
 - c. Difficult sport requiring athletic ability and knowledge of sailing.
 - d. Operators should expect to get wet.
 - e. Guard against hypothermia (wear wet or dry suits).
 - f. Operators of sailboards often do not consider themselves boaters.
 - g. Should boat in groups for safety.

Cite example from “Judgment on the Water” or read fatal recap.

BH chapter 4, pg. 33-35

- 5. Hunters and Anglers
 - a. Hunters and anglers that use boats sometimes forget that they are also boaters.
 - b. Use the boat as a platform from which to fish or hunt.
 - c. Often at high risk for hypothermia due to cold weather boating.
 - d. May be unaware of safe boating concepts (boat equipment, laws, rules of the road, etc.)
- 6. Paddle sports
 - a. Canoeing and kayaking are “get wet” sports that are very popular in Pennsylvania. Best learned from experienced instructors.
 - b. Knowledge, preparation and practice can minimize dangers.
 - c. Primary hazards include capsizing, falling overboard, and swamping.
 - d. Never stand up in canoes or kayaks. Always maintain three points of contact when moving around.
 - e. Distribute the weight in the boat evenly from side-to-side and bow-to-stern (keep the bow light).
 - f. Keep shoulders inside gunwales especially when retrieving items from water.
 - g. In moving water (river current), self-rescue swimming is crucial
 - h. Never exceed skill level when confronted with extreme weather conditions, long distances from shore, and fast current. Never paddle alone. There is safety in numbers.

CHAPTER FOUR

PA OPERATION REQUIREMENTS, NAVIGATION AND COMMUNICATIONS

Topics—Teaching Time --1 to 1.5 hours

Pennsylvania Operation Requirements

Navigation Rules

Aids to Navigation

Long Distance Communication

Goal

The foundation of the Navigation Rules is good seamanship. Instruct students in PA boat operator requirements, the rules of the road, how to identify the U.S. Aids to Navigation System, and how to communicate on the water in both non-emergency and emergency situations.

Learning Objectives (Student Performance Objectives)

Students will:

1. Cite three of the PA requirements for boat operations.
2. Describe the concept of constant bearing and decreasing range.
3. Cite the difference between a stand-on and a give-way vessel.
4. Identify stand-on and give-way vessels (day and night) for meeting, overtaking, crossing, non-motorized and commercial craft situations.
5. Identify a boat's "danger zone."
6. Identify a short and prolonged whistle blast and their use when signaling another boat of your intentions.
7. List the lighting requirements for powered and un-powered boats.
8. Recognize the U.S. Aids to Navigation System and how they are used to navigate.
9. Describe the use of a VHF marine radio for distress, general ship-to-ship conversation, and hailing a bridge or lock tender.
10. Cite two other means of communicating on the water other than the use of a VHF radio.

Materials/Equipment

Boat America DVD video clips

TV/DVD player and VCR or projector and screen

PA Boating Handbook for each student

Athletic whistle, portable side (combination) and stern lights, U.S. Aids to Navigation System buoys, aids-to-navigation decal, and portable VHF radio

PA OPERATION REQUIREMENTS

BH chapter 2, pg. 7-8

1. Pennsylvania requirements
 - a. Watercraft may not be operated in a reckless, negligent, or dangerous manner.
 - b. Boats must be operated at a rate of speed that will not endanger the life or property of any person.
 - c. Boats must operate at slow-no wake speed when within 100 feet of the shoreline, floats, docks, launching ramps, swimmers or downed skiers, anchored, moored or drifting boats, or areas marked with "Slow - No Wake" buoys. **TQ#32**
 - d. Operation of a motorboat less than 20 ft. in length at greater than slow-no wake is illegal while a person is standing on/in the boat.
 - e. It is unlawful to operate a motorboat not equipped with railings or other safeguards at greater than slow-no wake speed while a person is riding on bow decking, gunwales, transom, or motor cover (some exceptions, i.e., seat built into motor cover).
 - f. It is unlawful to cause a boat to become airborne or completely leave the water while crossing the wake of another boat when within 100 feet of the boat creating the wake.
 - g. It is unlawful to weave through congested traffic.
 - h. Following too close to another boat, including personal watercraft, is unlawful. Following too close shall be construed as operating in excess of slow-no wake speed within 100 feet to the rear or 50 feet to the side of another boat that is underway, unless the boats are operating in a narrow channel, in which case the boats may operate at the speed and flow of other boat traffic.
 - i. Operating within 100 feet of a water-skier being towed by another boat is unlawful.
 - j. It is unlawful to operate a pontoon boat at greater than slow-no wake speed while a person is riding outside the passenger carrying area.
 - k. It is unlawful to operate within 100 yards of any U.S. Navy vessel. You must operate at slow-no wake speed when within 500 yards of any U.S. Navy vessel.

Provide examples to illustrate each age requirement.

BH chapter 2, pg. 7-9

2. Minimum age for operation of motorboats
 - a. A person eleven years of age or younger may not operate a motorboat propelled by a motor greater than 25 horsepower.
 - b. No person born on or after January 1, 1982 may operate a motorboat propelled by a motor of 26 horsepower or greater without first obtaining a Boating Safety Education Certificate.
3. Boat operator's responsibilities
 - a. Safety of all passengers.
 - b. Boat's wake and damage caused by it.
 - c. Maintaining a proper lookout and a safe speed.
 - d. Using good seamanship (making good decisions - sound judgment).
4. Boating in new places **Give example.**
 - a. Legal requirements for boats and the rules for boating vary from state to state and even from place to place within a state.
 - b. People boating on unfamiliar waters should check with that state or local boating authority for specific laws and regulations.

NAVIGATION RULES

BA DVD Clip: Ch. 3: Navigation Rules (3:58)	BH chapter 2, pg. 6-7
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BH chapter 3, pg. 24-28

1. Good seamanship
 - a. Foundation of the Navigational Rules.
 - b. Includes awareness, anticipation, maintaining a proper lookout, and caution.
 - c. Collision avoidance is the purpose of the Navigational Rules.
 - d. Requires boaters to make choices.
 - e. There are few signs, traffic lights, or lines on the water.
 - f. Common sense is required but is not enough; boaters must know the rules.
2. Basic navigation rules that apply to all boaters
 - a. Keep a proper lookout (rule #5 in Navigation Rules).
 - i. Avoid being surprised; utilize all your senses to remain alert.
 - ii. Look all around constantly for swimmers, obstructions, anchored boats, etc.
 - iii. Look on both sides to be sure there is room before turning.
 - iv. Most collisions occur because someone did not keep a proper lookout.
 - b. Maintain a safe speed at all times (rule #6)
 - i. "Safe speed" depends on several factors: the boater, the boat, environmental conditions, and traffic density (best factor to determine safe boat speed). **TQ#29**
 - ii. Always maintain control of the boat so that the ability to avoid a collision (by stopping or maneuvering) is never in doubt.
3. Risk of collision (rule #7)

BH chapter 3, pg. 25

 - a. Boaters must determine if risk of collision exists.
 - b. It begins when you decide that your boat and another boat are likely to reach the same place at the same time.
 - c. A constant bearing (the direction of an object from the observer) with a decreasing range (distance) means a risk of collision exists; change in bearing reduces the risk of collision.
 - d. Risk of collision makes your boat either a stand-on or give-way vessel.
 - e. Do not assume that other boater knows the rules.
 - f. Ends with both boats clear and moving apart.

Have students simulate risk of collision.	BH chapter 3, pg. 26-27
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4. Give-way vessel (rule #16)
 - a. Must take early and substantial (obvious) action to keep clear of other boats.
 - b. Make other vessel operator aware of your intentions.
 - c. Stop or slow down and pass astern (behind) the other vessel. **TQ#28**
5. Stand-on vessel (rule #17)
 - a. The boat with the right-of-way.
 - b. Maintain course and speed.
 - c. If give-way vessel follows the rule, a collision cannot occur.
 - d. If the other boat is not doing its job, take action to avoid a collision; you are still the stand-on vessel, but you are making the choice.

Have students simulate all situations.

BH chapter 3, pg. 26-28

6. Rules for power driven vessels underway
 - a. Head-on (meeting) situations (rule #14)
 - i. Turn to the starboard to pass each other like cars on the road (port side to port side). **TQ#27**
 - ii. Both are give-way vessels
 - b. Overtaking (passing) situations (rule #13)
 - i. Powerboats being overtaken by sailboats and manually powered craft are stand-on vessels.
 - ii. The boat being passed is the stand-on vessel. **TQ#30**
 - iii. The overtaking boat is always the give-way vessel.
 - iv. The overtaking vessel may pass on either the starboard or portside.
 - c. Crossing situations (rule #15)
 - i. The boat crossing from the right is the stand-on vessel.
 - ii. The danger zone on vessels is dead ahead to 22.5 degrees abaft the starboard beam (dead ahead and to the right, or 12 to 4 o'clock). **TQ#26**
 - d. Whistle signals
 - i. One boat signals intent, other boat responds in kind.
 - ii. One - I intend to leave you on my port side; I will turn to the right.
 - iii. Two - I intend to leave you on my starboard side; I will turn to the left.
 - iv. Three - My engine(s) in reverse
 - v. Danger or doubt - 5 or more short blasts.
 - vi. Each blast: short = 1 second; prolonged = 4 to 6 seconds.

Show difficulty of using an athletic whistle for a prolonged blast.

7. Other important rules of the road
 - a. Sailboats (sail only) and unpowered boats have right-of-way over powerboats unless overtaking powerboats or if the powerboat is at anchor.
 - i. Powered boats should steer clear of unpowered boats so their wake does not cause them trouble.
 - b. In narrow channels:
 - i. Recreational boats less than 65 ft. in length must not hamper the operation of large vessels, which cannot navigate outside the channel.
 - ii. Vessels shall keep as near to the outer limit of the channel which lies on her starboard side, as is safe and practicable.
 - c. Vessels restricted in their ability to maneuver (large commercial vessels such as tugs, barges, and ferry boats, vessels fishing with nets and trawls, anchored boats), and vessels not under command (usually due to a mechanical problem) are stand-on vessels.

8. Night operation/lights

Show lights.

BA DVD Clip: Ch.3: Night Boating (2:54)

BH chapter 2, pg. 14-16

- a. At night, operating at a safe speed and keeping a proper lookout becomes more important and demanding for the operator.
- b. Lights are required from sunset to sunrise and during periods of restricted visibility. **TQ#33**
- c. Lights identify the position of your boat and indicate the direction that boats are traveling when underway.

- d. Location and colors of lights.
 - i. Side - green to starboard and red to port, 112.5 degrees arc of coverage.
 - ii. All around - white, 360 degrees, at anchor, proceed cautiously.
 - iii. Mast - white, high, seen from dead ahead or forward 225 degrees.
 - iv. Stern - white, seen from behind boat (aft), 135 degrees.
 - a) Used in combination, the mast and stern lights are equivalent to an all-round light.
- e. All unpowered watercraft, other than sailboats 7 (23 ft.) meters and over, must display a white light to prevent a collision with another watercraft, which must be visible for two miles.
- f. Sidelights and a stern light must be displayed on sailing vessels 7 meters in length and over.
 - i. A single green light on the water, properly displayed, indicates the starboard side of a sailing vessel (single red for port side).
 - ii. A stern light can only be seen from aft.
- g. Motorboats must display all-around white lights that are visible for two miles; combination or sidelights visible for one mile.
 - i. Combination or sidelights must shine red to the port and green to the starboard.
- h. All boats regardless of length must display an all-around white light when anchored after sunset:
 - i. in or near a channel **TQ#34**
 - ii. in an anchorage not designated as a special anchorage
 - iii. where other vessels normally navigate; this includes all boatable Commonwealth waters.

AIDS TO NAVIGATION (ATON)

BA DVD Clip: Ch. 3: Navigation Aids (2:22)	BH chapter 3, pg. 24-25
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1. Purpose of ATON is to help boaters avoid problems and for navigation; best when used in combination with nautical chart.
 - a. Learn the system and presume nothing; navigational aids can be moved by the Coast Guard, other agencies, storms, heavy current, or by vandals.

Show sample buoys.

2. U.S. Aids to Navigation System.
 - a. Regulatory markers - white can buoys with orange shapes and black lettering.
 - i. Diamond - danger.
 - ii. Diamond with a cross - boats keep out. **TQ#31**
 - iii. Circle - controlled area. **TQ#35**
 - iv. Square - information.
 - b. Green buoys - marks left when looking upstream.
 - c. Red buoys - marks right when looking upstream.
 - d. Mid-channel buoys - white can buoy with vertical red stripes, pass close on either side.
 - e. Mooring buoys - white sphere with a narrow blue band around middle.
 - f. Day boards - red triangle or green square mounted on a piling; used instead of buoy.
3. International system - for everywhere else.
 - a. Markers designate the edges of a channel and the direction of open water.

- b. Securely fixed markers or floating buoys.
- c. Colors are important - red and green; red on right returning from open water.
- d. Numbers get larger as you continue upstream, beginning at the mouth and continuing toward the source; red - even numbers (on right going upstream), green - odd numbers (on left going upstream).

LONG DISTANCE COMMUNICATION

Show example if possible.	BH chapter 3, pg. 28
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1. VHF radiotelephone
 - a. A VHF (very high frequency) radiotelephone is used to communicate with other boaters, the Coast Guard, commercial vessels, draw bridge tenders, and lock operators.
 - b. Recreational boats are not required by federal law to carry radiotelephone equipment, but they are highly recommended on larger waters.
 - c. The Federal Communications Commission (FCC) regulates their use.
 - d. Boats carrying more than six passengers for hire, as well as many other commercial craft, are required to carry radio equipment.
 - e. Operators of commercial craft should consult the nearest FCC office to determine the requirements that apply to you and your boat.
 - f. Central FCC office is in Gettysburg, 1-888-CALL-FCC.
 - g. The VHF band has many channels; recreational boaters have limited access; examples of channels as follows:
 - i. 06 - intership safety communications only.
 - ii. 09 - commercial and non-commercial internship, ship to coast (commercial docks, marinas, and some clubs), secondary channel for hailing and distress, monitored by the Coast Guard.
 - iii. 13 - ocean going vessels, bridge tenders, tugs while towing, locks.
 - iv. 16 - distress safety and calling, call Coast Guard, establish general contact, must be monitored, not for "chit-chat," call "Mayday" only when "grave and imminent" danger threatens your boat and immediate help is required.
 - v. 22A - U.S. Coast Guard vessels, shore stations, USCG marine information forecasts.
 - vi. 24 to 28, 84 to 88 - public telephone calls (to call the "marine operator").
 - vii. 68,69,71,72,78 - non-commercial internship (recreational boat working channels) and ship to coast (marinas, yacht clubs, etc).
 - h. There are marine weather (WX-1, WX-2, WX-3) stations, which broadcast the latest available weather information from the National Weather Service continually; updated every 6 hours.
 - i. Radiotelephone users must familiarize themselves with broadcasting procedures; in an emergency, give your position first.
2. Cellular phones
 - a. Are very useful but not as a substitute for a VHF radio.
 - b. Best to know emergency numbers in location where boating.
 - c. Disadvantages include
 - i. No service at many locations.
 - ii. Dead battery common.
 - iii. Usually not waterproof
 - iv. Usually not useful for locking through or contacting the Coast Guard.

CHAPTER FIVE

BOAT OPERATIONS

Topics—Teaching Time -- 45 minutes to 1 hour

Trailer
Boat Handling
Docking
Anchoring
Locking Through

Goal

Students will receive classroom information and instructor knowledge about various boating skills needed to become a safe and confident boater.

Learning Objectives (Student Performance Objectives)

Students will:

1. Describe what must be included in a "total" trailering package.
2. Describe how to properly attach safety chains to a vehicle.
3. Cite three safety precautions to follow when pulling a trailer on the highway.
4. Cite the steps necessary to properly launch and retrieve a boat following proper ramp etiquette.
5. Describe different types of anchors, their advantages and disadvantages, and the proper sequence to anchor a boat.
6. Cite the recommended scope length when anchoring.
7. Describe the advantage of docking a boat going against the current or wind.

Materials/Equipment

Boat America DVD video clips
TV/DVD and VCR player or projector and screen
PA Boating Handbook for each student

TRAILERING

BA DVD Clip: Ch. 2: Trailering (2:20) | BH chapter 3, pg. 21

Trailers are grouped into classes based on the maximum combined weight (GVWR - gross vehicle weight rating) that they may legally sustain, including the trailer and everything stored on or in your boat

1. Equipment

- a. Trailering is a package deal; everything must match-- including boat, trailer, hitch, and tow vehicle.
 - i. Tow vehicle - May require extensive alteration if not equipped with towing package; check vehicle owner's manual and trailer's data plate.
 - ii. Hitches
 - a) Must match the trailer and should be mounted to the frame of the towing vehicle.
 - b) Bumper hitches should not be used.
 - iii. Ball coupler
 - a) Must be of proper size to match the coupler on the trailer tongue.
 - b) Diameter (usually 17/8 or 2 inches) and gross tonnage weight are normally stamped on ball.
 - iv. Trailer tires
 - a) Checks tire pressure before each trip.
 - b) Spare should be carried on trailer.
 - v. Safety chains
 - a) Pennsylvania law requires that a trailer be equipped with two safety chains attached to the towing vehicle in a criss-cross or "X" pattern.
 - b) Safety chains should be adjusted so that they do not drag on the ground, and will support the trailer if it becomes disengaged from the vehicle.
 - vi. Lights
 - a) Pennsylvania law requires that all trailers be equipped with the same lighting system required on the rear of the towing vehicle and that all lights operate in conjunction with the lights on the vehicle.
 - b) Two red reflectors are required on the rear of the trailer in addition to a white license plate lamp.
 - vii. Precautions.
 - a) Electrical connections.
 - b) Tie downs turnbuckle good at bow (do not rely on the winch line); secure stern with transom tie downs or rope.
 - c) Wheel bearings - should be protected, kept greased, checked periodically.

2. Handling on the road

- a. Practice in an empty parking lot - turning, parking, and backing up; place hand at 6 o'clock position on steering wheel; turn bottom of wheel in direction you wish trailer to go.
- b. Allow more time for braking; maintain safe distance from vehicle in front and allow extra room for turns.
- c. Secure all items in boat and make sure boat is dewatered.

3. Launching

- a. Develop a launching checklist.
- b. Inform passengers of safety procedures and boat operations.

BH chapter 3, pg. 22

- c. Always prepare the boat away from the launch ramp; turn on blower; check everything; wheel bearings need to cool.
 - d. Put the plug in.
 - e. Raise the motor.
 - f. Disconnect the trailer lights to allow bulbs to cool before being submerged.
 - g. Slowly back down the ramp; set emergency brake and block wheels.
 - h. Disconnect and secure the winch cable.
 - i. Push the boat off the trailer while someone is holding the bowline.
4. Retrieval is essentially the opposite of launching.

Ask students about launching (short “war stories”).

5. Once on shore
- a. Flush the engine's cooling system (if boating in salt water).
 - b. If boating on Lake Erie, scrape boat hull and use high-pressure water to clean the bilge and live wells to prevent spread of zebra mussels.
 - c. Park the trailer, lock the hitch, remove the plug, and raise the bow so water can drain from the stern.

BOAT HANDLING

BH chapter 3, pg. 22

- 1. Boarding
 - a. Stability is a safety issue; wearing a PFD is critical.
 - b. Secure boat.
 - c. Keep body low.
 - d. Keep weight centered.
 - e. Load items into boat one at a time, handing items to person already in boat.
 - f. Secure load.
- 2. Boat trim (the way a boat floats)
 - a. Vital in a small boat.
 - b. Distribute the weight in the boat evenly from side-to-side and bow-to-stern (keep the bow light).
 - c. Avoid sudden sharp turns.
 - d. Never exceed boat's capacity.
- 3. Boat handling
 - a. All boats handle differently. Inexperienced operators require hands-on practice with a capable teacher.
 - b. A motorboat is most easily maneuvered going against the current or wind; when moving with the wind or current, go faster to keep control of the boat.
 - c. If you need to quickly reduce speed, put motor in reverse and apply power.

DOCKING

BA DVD Clip: Ch. 3: Casting Off and Docking (3:00)	BH chapter 3, pg. 22-23
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- 1. Docking is a difficult maneuver for new boaters.
 - a. Docking procedures will vary depending on wind and water conditions.
 - b. Have fenders, mooring lines, a boat hook, and a heaving line ready.

- c. Plan how you intend to dock.
- d. Head into the current or wind if possible.
- e. When docking in current, slip sideways bit by bit toward the dock, pier, or slip.
- f. Secure bow and stern line.
- g. Do not fend off with hands or feet.

ANCHORING

BA DVD Clip: Ch. 3: Anchoring (1:26)	BH chapter 3, pg. 29
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1. Every boater must master anchoring.
2. Anchoring considerations
 - a. Type and weight of boat determines anchor size.
 - b. Character of bottom determines anchor type.
 - c. Types of anchors.
 - i. Kedge - for rocks and heavy grasses.
 - ii. Burying - buries into bottom; for sand and mud (Plow, Danforth, Bruce).
 - iii. Mushroom - sinks into bottom; for permanent moorings.
 - d. Average depth of water determines "anchor scope" - ratio of the amount of "rode" (anchor line and chain) to depth of water, 7:1 - 10:1). (NOTE: This is slightly different than the video.)
 - e. Strength of the wind and/or current.
 - f. Diameter of anchor line - too small or too large is bad; nylon is best.
 - g. Connect anchor to line with chain.
 - h. Boats should carry at least two anchors; a smaller, lighter anchor for calm weather, and a larger anchor are best for bad weather conditions or when anchoring overnight.
 - i. Anchors can become stuck and the line must be cut; backups are often necessary.
3. How to anchor
 - a. Head your boat into the wind or current.
 - b. Lower anchor with line under bow rail; make sure you are not standing on any part of the line as it goes over the side; be sure the end of the anchor line is tied to the bow of the boat.

TQ#24
 - c. Reverse the engine or back off.
 - d. When the boat starts to make a slight sternway through the water, lower the anchor from the bow.
 - e. When about 1/3 of the rode is out, stop the engine and tie off the line to a forward cleat to make the anchor dig into the bottom.
 - f. Let out the remainder of rode.
 - g. Sight on some stationary objects to make certain that the anchor is not dragging; reset anchor if necessary.
 - h. Lift the anchor as vertically as possible, wash it, and try to keep it from hitting the boat.
 - i. Cautions:
 - a. Pulling up an anchor can swamp a small boat; anchors will not always come loose.
 - b. The anchor line should be tied to the bow. Never anchor from the stern, especially in small boats.

LOCKING THROUGH

Teaching this section is optional. BH chapter 3, pg. 30-31

1. In Pennsylvania, locks and dams are located on the three rivers; Monongahela, Allegheny, and Ohio.
 - a. Locks are built and maintained by U.S. Army Corps of Engineers.
 - b. Dams provide a navigable channel for river traffic; locks pass vessels through the dams.
 - c. All dams are dangerous to boaters, especially the low head types associated with locks.
 - d. Difficult to see from upstream.
 - e. Normally buoyed off.
 - f. At locks, the lockmaster is in control.
 - g. Priorities (of boats) are set for safe and efficient passage: 1st-military craft, 2nd-mail boats, 3rd-commercial passenger craft, 4th-commercial tows, 5th-commercial fishermen, and 6th-pleasure boats.
2. Entering a lock
 - a. Put on PFD.
 - b. Stop the boat at least 100 yards from the lock entrance.
 - c. Signal with a long and short blast, on the marine radio (Channel 13), or with a device on lock wall; once the lockmaster has been signaled, stay clear of the chamber until signaled to enter.
 - d. Have fenders and mooring lines ready to heave to lock man; have knife available to cut line if needed.
 - e. Adjust line with water levels; larger boats need two lines (minimum 75 feet each); only tie off one end of mooring line to boat.
3. Light system - obey the one that is flashing
 - a. Red - stand clear, do not enter.
 - b. Amber - approach lock under full control.
 - c. Green - enter lock.
 - d. Amber and green - enter lock with caution.
4. Horn system
 - a. One long blast of the whistle indicates permission to enter the lock chamber in case of a single lock or to enter the landward (closest to land) chamber in case of twin locks.
 - b. Two long blasts of the whistle indicate permission to enter the riverward chamber in case of twin locks.
 - c. One short blast of the whistle indicates permission to leave the lock chamber in case of a single lock or to leave the landward chamber in case of twin locks.
 - d. Two short blasts of the whistle indicate permission to leave the riverward chamber in case of twin locks.
 - e. Do not retrieve lock lines until signaled to leave the lock.

CHAPTER SIX

SAFETY AND RESCUE

Topics—Teaching Time – 30 to 45 minutes

Float Plan

Check List and Passenger Safety

Water Hazards

Rescue and Survival

Hypothermia

Alcohol and Boating

Law Enforcement

Goal

Provide instruction and information that will help students learn that safety on the water requires a boat operator to develop an understanding and appreciation for the type of water they will be boating on, and that safe boating also requires developing fundamental rescue skills in the event of an emergency.

Learning Objectives (Student Performance Objectives)

Students will:

1. Complete a float plan.
2. List five common water hazards.
3. Identify the features of a low-head dam.
4. Cite three ways to identify changing weather conditions.
5. Describe the rescue sequence.
6. Describe the purpose of the HELP and Huddle position.
7. List the effects of alcohol on a boat operator or passenger.
8. Cite the legal requirements for alcohol.

Materials/Equipment

Boat America DVD video clips

TV/DVD player and VCR or projector and screen

PA Boating Handbook for each student

Videos: National Livery Safety System, "You're in Control . . . A Guide to Safe Paddling";

American Canoe Association, "Cold, Wet and Alive.

low-head dam handout, hypothermia tank, ice and water, examples of outdoor clothing.

BH chapter 3, pg. 21

FLOAT PLAN

1. Essential information regarding your boat, vehicle, and destination in the event of an emergency or an overdue trip.
2. Boaters should always tell someone when and where they will be boating and date and time of return.
3. For longer trips a detailed float plan (dates, itinerary for trip, persons aboard, individuals to contact if late, etc.) should be filed with a friend or relative; do not file with USCG or PFBC. **TQ#18**
4. Once returned, cancel plan.

BH chapter 3, pg. 20

CHECK LIST AND PASSENGER SAFETY

1. Before any boat trip, check boat and equipment to prevent problems
2. Make a list of items to check and keep it on the boat for use prior to each trip
3. Inform all passengers on your boat where all safety equipment is located (life jackets, fire extinguishers, flares, first-aid kit, etc.) **TQ#20**
4. Discuss with all passengers any procedures you might encounter—docking and line handling, anchoring, falls overboard, emergency boat operation, storm/rough weather situations, radio operation, discharge/management of any wastes.

Optional Video: National Livery Safety System – “You’re in Control... A Guide to Safe Paddling.” (7:56)	BH chapter 5, pg. 37-39
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WATER HAZARDS

1. Moving water hazards
 - a. Safety on the water is dependent upon developing respect for the power of water.
 - b. Current – strong currents are very deceptive; should be taken into account by all boaters. **TQ#14**
 - c. Strainers - obstructions in the waters that allow water to pass through but hold and trap boats and boaters (examples: trees, fences).

Cite examples of how classified waters may change, based on weather and water conditions.

2. Rivers and rapids are rated with the International Scale of River Difficulty which is a guide established by American White Water Affiliation; parts of rivers could have a different rating than the overall rating:
 - a. Class I - Moving water with few riffles and small waves; easy boating; few or no obstructions.
 - b. Class II - Easy rapids with waves up to 3 feet with wide, clear channels; some maneuvering is required.
 - c. Class III - Rapids with high, irregular waves; narrow passages that may require scouting and complex maneuvering.
 - d. Class IV - Long, difficult rapids with constricted passages in sometimes very turbulent waters; scouting from shore is necessary; conditions make rescues difficult.
 - e. Class V - Extremely difficult, long, violent rapids with highly congested passages; rescues are difficult and there is significant hazard to life in event of a mishap.

- f. Class VI - difficulties of Class V carried to the extreme; boating is nearly impossible; for highly skilled teams of experts only.
3. Large bodies of water
- a. Size - large bodies of water such as oceans or Lake Erie provide different challenges and dangers than does moving water.
 - b. Depth - large, relatively shallow lakes such as Erie may develop large waves faster than deeper, similar water.
 - c. Waves
 - i. When boating in waves or crossing another boat's wake, quarter the waves at an angle; this reduces pounding.
 - ii. Broaching - the sudden, unplanned and uncontrolled turning of a boat so that the hull is broadside to the waves or wind.
 - iii. Pitch-poling - when a boat rides down the front of large following wave, the bow buries itself causing the boat to flip end over end.

Teaching this section (Tides) is optional.	BH chapter 5, pg. 37
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4. Tides
- a. The vertical rise and fall of ocean water and waters affected by the ocean, caused by the gravitational forces of the moon and the sun.
 - b. Can affect where a boater can travel or anchor safely.
 - c. Affects how long it takes to get to a destination, the speed needed to arrive at a given time, and the heading that must be maintained.
 - d. "High tide" - highest level reached by an ascending tide.
 - e. "Low tide" - the lowest level reached by a descending tide.
 - f. Tidal cycle - high tide followed approx. 6 hours later by low tide (two highs and two lows per day).
 - g. Tidal range - vertical distance between high and low tides, varies from 1 to 11 feet in PA on the Delaware River.
 - h. Consult tide tables for times of high and low tide.
5. Shallow water
- a. Keep a sharp lookout when traveling on waters that have shallow area to avoid running aground. Navigation charts, buoys and depth finders can assist in this task.
 - b. If you run aground:
 - i. Do not put the boat in reverse. Lift the out drive.
 - ii. Shift weight away from the point of impact.
 - iii. Try to shove off, if this doesn't work, contact help.

6. Manmade hazards

BH chapter 5, pg. 38

- a. Low head dams
 - i. Commonly known as "drowning machines."
 - ii. The hydraulic below a dam has three distinct features: a boil, outwash and backwash.
 - iii. Dangers exist from above (going over the dam) and below the dam.
 - iv. Boaters approaching a dam from down steam can be "caught" by the recirculating current and pulled into the dam where their boat swamps and capsizes. The boats motor will be ineffective in the oxygenated water once they cross the "boil" line. **TQ#16**
 - v. Dams can be identified by looking downriver for a horizontal line going across the water.
- b. Utility cables, power lines, bridge piers, marker buoys.
- c. Debris - people throw everything in the water (rope/fishing line, garbage, cars, etc.).

- 7. Environmental hazards
 - a. Cold water
 - b. Remoteness of the area

BA DVD Clip: Ch. 5: Severe Weather (1:00)	BH chapter 5, pg. 38-39
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- 8. Weather
 - a. Conditions of the atmosphere.
 - b. Can be observed and measured.
 - c. Weather determining factors: temperature, barometric pressure, and wind.
 - d. Affects the condition of the open water.
 - e. Two types of weather.
 - i. Movement of large air masses across the world.
 - ii. Weather caused by local, seasonal conditions (most unpredictable type of weather).
 - f. Signs that the weather will change
 - i. A buildup of dark clouds that increase in size (the faster the clouds develop, the greater the chance of storms, strong winds, and lightning). **TQ#17**
 - ii. Sudden temperature drop and/or a rapid wind shift or change in the wind's speed usually indicates a front coming through.
 - iii. Static on the AM band of the radio.
 - g. If a storm is near
 - i. Small open boat safety – don a PFD, head for the nearest safe shore and beach your boat; find a shore on the leeward (downwind) side of the land. **TQ#15**
 - ii. Large boat safety – don a PFD; secure sails (if applicable); start the engine; stow unnecessary items below; secure dinghy (if you have one); turn on running lights; close the boat; decide what to do; if land is near, head for it, if not, ride out storm keeping bow headed into waves wind and/or current; consider anchoring with lengthly scope.
 - h. Local weather information
 - i. National Weather Service issues a new marine forecast every six hours on designated VHF radio channels or telephone the National Weather Service for latest forecast.
 - ii. National, state and county parks.
 - iii. State agencies such as the PA Fish and Boat Commission.
 - iv. Websites, including real-time water data from USGS at:
<http://water.usgs.gov/realtime.html>

RESCUE AND SURVIVAL

BA DVD Clips: Ch. 4: Rendering Aid (:44), Ch. 5: Cold Water Immersion (1:16)	BH chapter 5, pg. 41-43
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Cite examples of each type of rescue and the dangers associated with each.

1. Be prepared -- never count on rescue
2. Follow the rescue sequence when attempting to recover people in the water
 - a. Self rescue
 - b. Shore-based rescue – reaching and throwing rescues
 - c. Boat based rescue.
 - d. Go rescue - requires direct contact; only for trained personnel.
3. The method of rescue will depend on:

- a. Your training and skill.
- b. Condition of the victim.
- c. Location of the victim.
- d. Equipment available.
- e. Additional support at the scene.

BH chapter 5, pg. 42

HYPOTHERMIA

1. Definition - Lowering of the body's core temperature. **TQ#38**
2. Heat loss can be caused from exposure to the elements (water cools a person approximately 25 times faster than air of the same temperature).
3. Heat loss areas: head (loses over 50% of heat), underarm, and groin.
4. Signs and symptoms
 - a. Shivering
 - b. Cold, blue skin
 - c. Decreased mental skills/loss of judgment
 - d. Slurred speech
 - e. Slow heart rate
 - f. Muscle stiffness
 - g. Coma
 - h. Death
5. Prevention
 - a. Prepare for worst wet conditions.
 - b. Eat high-energy foods to keep producing heat in the body.
 - c. Dress properly; wear a hat.
 - d. Keep the heat in by layering clothes.
 - e. Cotton is a poor insulator when wet; polypropylene, silk, polyester pile, neoprene, and/or wool with a water and wind repellent outer layer are best.
6. Basic first aid
 - a. Get the person out of water or weather as quickly as possible.
 - b. Take off wet clothes and put on dry ones.
 - c. Wrap in blankets and warm person slowly.
 - d. Do not give anything by mouth if unconscious.
 - e. Get medical attention as soon as possible. **TQ#45**
7. Cold water shock
 - a. Rapid development of a number of shock responses that can result in sudden drowning.
 - b. One of the first responses by the body upon sudden immersion in cold water is an involuntary gasp (torso reflex).
 - c. Covering mouth and nose with your hands when falling into cold water reduces the chance of inhaling water.
 - d. Hyperventilation (rapid breathing) and breathlessness follow. Victim may panic.
 - e. Hyperventilation can reduce blood flow to the brain, causing confusion in the victim.
 - f. Cold water vastly reduces the victim's ability to hold his breath.
 - g. Loss of breathing control and reduced breath-holding ability will impair a victim's ability to swim.
8. Cold water survival
 - a. Wear a life jacket.
 - b. Do not remove clothing; keep clothes on.
 - c. Stay with the boat! Get back into or climb on top of boat **TQ#41**

- d. If you can't get out of the water, or shore is too far, get into the Heat Escape Lessening Posture - (HELP) or Huddle position if more than one person. **TQ#39**

ALCOHOL AND BOATING

BH chapter 5, pg. 43

1. Drinking and boating do not mix.
 - a. Alcohol is a depressant; affects balance, vision, and coordination (crucial to small boat operators); alcohol increases heat loss by dilating blood vessels so hypothermia occurs faster.
 - b. Alcohol combined with engine noise, vibration, and environmental conditions fatigues boaters.
 - c. Reduces judgment causing higher risk taking.
 - d. An officer can stop a boat and arrest the operator for being under the influence. **TQ#25**
2. Pennsylvania legal requirements
 - a. It is illegal to operate a watercraft on all waters of the Commonwealth while under the influence of alcohol or a controlled substance.
 - b. Alcohol is prohibited on land and water at all state parks and at most U.S. Army Corps of Engineer projects.
 - c. Pre-arrest breath tests can be used as an indicator to determine the probability of operating under the influence of alcohol.
 - d. A blood alcohol content of .08 percent or more is considered to be over the legal limit (0.02% b.a.c. for minors).
 - e. Fines up to \$7,500 and up to two years in jail, plus the loss of boating privileges for one year can be imposed if convicted.

LAW ENFORCEMENT

BH chapter 6, pg. 44

1. Boating laws and regulations are enforced by Waterways Conservation Officers - WCOs or Deputy Waterways Conservation Officers - DWCOs.
2. Boaters approached by a patrol boat with blue light flashing must reduce speed or stop and wait for instructions.

PWC ADDENDUM

This addendum is designed for optional use when instructing students who predominantly own or operate personal watercraft (PWC).

To stay within the 8 hour time allotment for this course, the instructor may want to spend less time instructing topics in the lesson plan that are less PWC specific as long as all test questions in deleted sections are covered. Examples: Marine Sanitation Devices (page 24), Long Distance Communication (page 36), Anchoring (page 42)

Show the video, “Jet Smart”, or other PWC specific video, before beginning instruction on “Types of Boats and Nomenclature” on page 15 of the Basic Boating lesson plan.

Use the section below as a supplement to “Different Types of Motors” on page 15 of the Basic Boating lesson plan.

1. Jet Drive Basics
 - a. PWC are pushed through the water by the action of a jet pump driven by the engine.
 - b. The pump works by drawing water into the housing ahead of the impeller.
 - c. The impeller forces the water into a pressurized stream toward the back of the personal watercraft.
 - d. Force of the exiting water pushes the boat in the opposite direction.
 - e. Not having an exposed propeller make PWC safer than many boats. However, to be safe precautions include:
 - i. Keep hands, feet, hair, and clothing away from pump intake.
 - ii. Turn engine off when checking the pump intake.

Use the section below as a supplement to “Boat hull types” on page 15 of the Basic Boating lesson plan.

2. Shapes and Sizes
 - a. PWC have planing hulls, which are somewhat flat with a slight rounded "V."
 - b. Planing hulls ride on top of the water once a certain speed is reached.
 - c. PWC hulls are designed to flip upright easily if overturned. Follow the manufacturer's instructions.
 - d. PWC are designed to allow riders to reboard safely over the stern if they should fall off.
 - e. Each model varies in stability and performance, as well as required operator skill-level.
 - f. Two main types of models - stand up and sit down; sit down models able to carry two or three people.
 - g. Each model has unique characteristics and features.

Use the following section below as a supplement to “Boat Terminology” on page 16 of the Basic Boating Lesson Plan.

3. Personal watercraft terminology
 - a. Lanyard - engine shut-off cord; attached to the operator and to the vessel.
 - b. Impeller - precision propeller enclosed within a housing at the bottom of hull.
 - c. Steerable nozzle - device used for directing the stream of water to the left or right at the stern of the PWC that steers the boat.
 - d. Drive shaft - the nozzle is connected to the drive shaft, the long stem connection between the handlebars and the impeller, and moves when the handlebars are turned.
 - e. Intake - opening that draws water toward the impeller to help drive and direct the PWC.
 - f. Grate - screening cover placed over the intake opening; prevents large debris from passing through the water intake area and damaging the impeller.
 - g. Rub Rail - rubber strip that surrounds the widest part of the hull to prevent damage when bumped; usually near the waterline.
 - h. Handlebars - curved bars attached to the steering column where operators rest their hands, as well as control the drive shaft that changes the direction of the boat when in motion.
 - i. Throttle - controls speed by regulating the amount of fuel delivered to the engine.

Use the section below as a supplement to “Different Types of Motors” or “Boat Hull Types” on page 16 of the Basic Boating lesson plan.

4. PWC Characteristics
 - a. PWC are small compared to most boats - average 7 to 9 feet and no longer than 16 feet in length.
 - b. PWC have jet pump propulsion which eliminates any rudder or propeller on the external part of the hull.
 - c. The operator sits on top of the hull.
 - d. All new PWC are equipped with a lanyard cut-off device.
 - e. When the engine stops or loses power, the boat cannot be maneuvered - it has no turning ability.
 - f. PWC have a shallow draft and can be safely operated in as little as two feet of water.
 - g. PWC's are easily maneuvered and can turn quickly at a high rate of speed.
 - h. The fuel tank on most PWC's is directly under the seat area.
 - i. The latest PWC models may have sound baffles in the engine area.

Use the section below as a supplement to “General Information” in the Personal Watercraft (PWC) Section on page 28.

5. Operator controls
 - a. Anyone who plans on operating a PWC should read the owner's manual.
 - b. All PWC have similar controls, located in different places on different models.
 - c. Start and stop switches activate and turn off the engine.
 - d. The lanyard is connected to a shut-off switch on the steering column and to the operator (usually around the wrist) at start up.

- e. If the operator falls off, the lanyard will disconnect from the shut-off switch and stop the engine.
- f. Most models provide a manual choke, which allows the operator some help in starting a cold engine.
- g. Two types of throttles - pull and push.
 - i. Pull is positioned on the right handgrip and is activated with a pull of the fingers.
 - ii. Push is positioned also on the right handgrip and is activated by a push of the thumb.
- h. Fuel selector switch is found on the dashboard or on the side of the boat by the operator's knee.
 - i. Choices are on, off, and reserve.
 - ii. Switch to reserve and head back to shore when all the fuel in the main tank has been used.
 - iii. Operators should use the 1/3 rule for fuel tank - 1/3 out, 1/3 back, and 1/3 for reserve.
- i. Most PWC have two-cycle engines that mix gasoline and a special oil. It is essential that the oil level be checked every time gasoline is added.
- j. Many PWC have a reverse lever or switch. Using reverse at high speeds or as a braking device could damage the mechanism and eject the operator from the boat. Use only at idle speed. A "bail device" moves over the directional nozzle and reverses the water flow.