An Introduction to Canoeing/Kayaking

A Teaching Module

Iowa Department of Natural Resources
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An Introduction to Canoeing and Kayaking

Introduction

This module is designed to acquaint students with basic information and skills for canoeing and kayaking on Iowa waters. This is a brief introduction to these outdoor activities. An annotated bibliography of additional resources related to teaching these concepts/skills is included at the end of the module.

Objectives

- ❑ Students will be acquainted with the history of canoeing and kayaking.
- ❑ Students will develop a set of guidelines for ethical conduct for canoeing and kayaking trips.
- ❑ Students will be acquainted with ways humans interact with natural resources including individual responsibility toward natural resources.
- ❑ Students will become familiar with basic safety and dress guidelines for canoeing or kayaking.
- ❑ Students will become familiar with terminology and equipment associated with canoeing and kayaking.
- ❑ Students will become familiar with basic strokes for canoeing or kayaking and demonstrate their ability to use them.
- ❑ Students will demonstrate appropriate techniques for entering, launching, and exiting a canoe or kayak.
- ❑ Students will become familiar with ways to prevent hypothermia.
- ❑ Students will practice river reading skills.

Materials

Suggested materials are listed for each activity.

Module Overview

This module is designed for upper elementary through adult audiences. It provides a ***basic*** introduction to canoeing and kayaking. There are many more in-depth resources to teach these topics. (See the **Additional Resources** section.)

The **Background Information** provides a brief overview for the educator or leader. It discusses the history of paddling; Iowa's aquatic resources and values related to them; types of paddling; equipment and terminology associated with canoeing and kayaking; basic strokes; and tips to plan a canoeing or kayaking trip. It also discusses paddling safety and Iowa regulations for canoeing and kayaking.

Each **Activity** includes an *overview* of the activity, *associated objectives*, estimated *time* needed to complete the activity, a list of needed *materials*, *directions* to complete the activity, suggested *evaluation*, and *extensions*. Finally, a listing of **Additional Resources** for topics covered here is included at the end of this module. This section also includes source information for publications and other resources mentioned in the **Background Information** and/or **Activities.**

Teaching Suggestions

Read through the **Background Information**. Depending on the goals for your program, select activities that emphasize the information/skills you want to cover.

Background Information

Paddling Then...A Brief History of Canoeing and Kayaking

Paddling has played a role in human history for at least 6,000 - 8,000 years. Early canoes and kayaks were used for transportation, survival (hunting and fishing), and trade. The earliest canoes were likely dugouts. They were made through an extensive process of carving and burning trees into a hollow craft. Dugouts were used by people throughout the world, from the West Indies, Africa, and the Middle East to North and South America.

Native Americans in the northern region of the continent created birchbark canoes. Bark from white birch trees composed the structure of the canoe. Roots from white pines were used to sew the birch together. The seams were sealed with pine resin. Wood from white cedars was used for the internal frame.

The design and materials were lighter and more maneuverable than dugout canoes. The birchbark canoe quickly became the chosen means of transportation for Native Americans. As French explorers and fur traders arrived in North America during the 17th century, they too adopted it to navigate rivers and lakes. Marquette, Joliet, and Lewis and Clark used this style of canoe while traveling. Until the late 19th century, the birchbark canoe was the fastest way to cross the continent.

Like canoes, kayaks were created by native people of North America. Eskimos used kayaks for centuries to hunt and fish. They were made by attaching seal skins over frames of wood and/or bone until they were almost completely covered. This made the kayak light and streamlined.

The British brought the kayak design to Europe in the late 19th century. A few people used it for recreation, but popularity increased after John MacGregor made a lighter and smaller version that was more maneuverable on white water rivers.

Canoeing, like bicycling, reached its height of popularity at the turn of the 20th century. Since style often mattered more than performance, recreational canoes often were elaborately decorated, with wide beams and long ornate decks. Canoeing and kayaking first were included in the Olympics in the 1936 Berlin Games.

After World War II, Grumman Aircraft Corporation began making aluminum canoes. Fiberglass canoes followed in the 1950s. The low cost and functionality of these new crafts swept the market and they became the most popular types sold. Fiberglass kayaks became the norm around the same time, but remained less popular than canoes in America.

Paddling Now...

Modern kayaks and canoes share the same basic design as the birchbark ones Eskimos used. Although today's canoes and kayaks are made differently, their popularity remains. In 2002, 20.6 million Americans paddled in canoes. The popularity of canoeing has risen 50 percent in the past seven years. Kayaking is now one of the fastest growing outdoor sports in the country. In a 2001-2003 survey, 10.2 million Americans paddled in kayaks.

There are many reasons for the popularity of these sports. Many people live hectic lives and want to get away for passive recreation. Paddling allows participants to see wildlife/nature from a different perspective than hiking, biking, or motorboating. Canoeing and kayaking are family sports that can be done on a nearby lake for an hour or on a river camping at various sites along the way. The relatively low cost and ease of care for equipment are other reasons people enjoy paddling.

Iowa's Aquatic Resources

Iowa's waters offer great recreational opportunities for paddlers. They are also very productive (rich in plant and animal life). The major types of waters in Iowa include lakes, ponds, streams, rivers, and wetlands. Iowa waters are typically referred to as "flat water." Other types of canoeing/kayaking are whitewater and sea. For more information on Iowa's aquatic resources, refer to *Iowa's Waters*: *www.iowadnr.com/education/iawtr.html*.

Natural lakes formed by glaciers are common in northwestern and north-central Iowa. A second type of natural lake, the **oxbow**, is formed when river channels change course and sediment blocks the ends of a **meander** (curve in a stream or river) in the old channel. **Constructed lakes** include recreational lakes, municipal water supplies, river impoundments, and surface mine lakes. Pick up a copy of the *Iowa Lake Fishing Guide* for more information about lakes in your area.

Most of Iowa's 87,000 **farm ponds** are in the southern half of the state because clay soils found there readily form a water-tight basin. **Marshes** are shallow waters dominated by cattails, sedges, and grasses.

Many paddlers enjoy spending a summer afternoon traveling an Iowa river. They range in size from intermittent streams that flow for short periods of time, to the Mississippi, which drains nearly one-third of the continental United States. There are more than 19,000 miles of **interior rivers** and **streams**. They are subject to violent and sudden fluctuations because of the nature of our soils, land use, and drainage. Headwaters of streams usually are quite clear and less subject to water fluctuations. Lower stream reaches tend to be more turbid and subject to greater pollution.

Obtain a copy of the *Iowa Canoe and Fishing Stream Access Guide* for a complete listing of access points along Iowa's interior rivers. The Big Sioux (northwestern Iowa) and the Mississippi River are popular paddling destinations as well. You must be aware of additional safety concerns such as commercial and recreational traffic on the Mississippi.

Issues Facing Our Aquatic Resources

Aquatic ecosystems have been greatly affected by alterations in the landscape. These alterations have impacted water quality and limited some recreational opportunities. Some alterations (e.g. channelization [straightening], removal of streambank vegetation, sedimentation from eroded soils) are apparent. Others (e.g. excess nutrients from runoff) may not be seen as easily. Following are some problems facing Iowa's aquatic resources as a result of human actions.

Destruction of Habitat

Iowa has lost much of its diversity. Since Euro-American settlement, 70 percent of forests have been cleared and more than 99 percent of prairies have been plowed. Soil was exposed and natural vegetation along rivers and streams was removed. This resulted in a drastic increase in erosion in watersheds and sediments entering our waters.

Wetlands have also been greatly reduced in number and size since Euro-American settlement. It is estimated Iowa had 4 million acres of wetlands in the mid-1800s (includes oxbows, floodplain wetlands, and natural lakes). Within 100 years of Euro-American settlement, approximately 95 percent of Iowa's wetlands were drained or filled.

Loss of riparian habitat has impacted Iowa streams and rivers. Urban development, highways, cropland, and other altered areas have less food and cover for wildlife. Sections of rivers that are unshaded or sediment-laden are poor habitat for fish and other aquatic organisms.

Streams and rivers naturally meander, changing their course over time. Pools and riffles between meanders support diverse aquatic life. Most of Iowa's interior rivers and streams have straightened stretches–some 3,000 miles of Iowa rivers have been lost. Water in straight streams flows faster, increasing erosion and deepening the channel. Habitat is eliminated when rivers are straightened and/or streamside trees and other plants are removed.

Pollution

Changes to watersheds often occur far from the affected body of water, thus cause and effects are not readily apparent. A variety of pollutants (e.g., sediment, nutrients, pesticides, animal waste, litter) may be found in Iowa's waters. Due to the potential presence of these pollutants, do not drink water directly from these sources (without going through a treatment plant). When paddling, always bring a personal supply of drinking water.

Sediment

The number one water pollutant in Iowa is silt (very fine soil). Most soil is carried to rivers and lakes by runoff after rains or streambank erosion. Silt decreases the amount of light that enters water, hence aquatic plants and algae suffer. It adds to bottom sediments; reduces fish habitat by filling holes and crevices where fish seek shelter; clogs gills of small aquatic animals such as insect larvae; smothers fish eggs and spawning sites; and interferes with sight feeders such as bass, which are unable to locate prey. Erosion is a natural process, but is accelerated greatly by human activity.

Nutrients

Nutrients are present throughout Iowa, naturally or artificially through fertilizers. Some are beneficial to aquatic ecosystems because they increase growth of plants and algae that are food and cover for smaller animals, which are food for fish and other larger animals. However, too many nutrients can cause problems in aquatic ecosystems.

Manufactured fertilizers containing nitrogen and phosphorous are used on crop fields, golf courses, and residential/business lawns and gardens. An estimated 30 to 50 percent of nitrogen used in Iowa is applied as fertilizer on agricultural land. Nitrogen from runoff often is found in lakes, rivers, and streams.

Excess nitrogen and phosphorous can cause overgrowths of algae (blooms) that sometimes cover the entire surface of a body of water, blocking sunlight from reaching the bottom. This slows photosynthesis in aquatic plants, reducing oxygen and increasing carbon dioxide as plants and algae die. This can result in fish (and other species) kills.

High levels of nitrogen are dangerous to humans and animals if consumed. In drinking water, it is converted to nitrite and prevents blood from carrying oxygen. This may cause brain damage and suffocation in both infants and newborn livestock.

Animal Waste

Besides acting as a nutrient, large amounts of animal wastes entering a body of water can kill fish and other aquatic animals. Over 1 million Iowa fish died in kills caused by manure discharge between 1997 and 2001. Fish kills have increased dramatically in the past few years.

High levels of coliform bacteria are used as an indicator that disease-causing bacteria from warm-blooded animals might also be present. In rivers, lakes, and ponds, levels often are higher than EPA standards for drinking water. Occasionally, they are higher than standards recommended for swimming or bodily contact. High levels often occur after a heavy rainfall when bacteria from feedlots, pastures, and faulty sewage treatment plants in the watershed enter water.

Pesticides

Pesticides (herbicides, insecticides, fungicides, etc.) commonly are used in agriculture, businesses, gardening/lawn care, and residential homes. Improper use can negatively impact aquatic ecosystems. The most widely-used **herbicides** may be detected in Iowa's rivers, lakes, and streams. However, DNR biologists collect samples of fish for analysis by the U.S. Food and Drug Administration (USFDA) and no samples have ever contained levels of pesticides above USFDA standards. Levels of contaminants in fish in Iowa continue to decrease since persistent pesticides were banned.

Litter

Litter is one of the most visible forms of pollution. Not only does litter make rivers and lakes ugly, it may also pose dangers to wildlife and humans. Plastic six-pack rings can catch on waterfowl necks and choke them. Aluminum cans and glass may cut wildlife or people. Always "pack out" what you "pack in."

Aquatic Invasive Exotic Species

Plants and animals introduced into habitats are **exotic species**. They may "take over" their new habitat. For more information on invasive aquatic exotic species, visit the Iowa Department of Natural Resources aquatic nuisance species website: *www.iowadnr.com/fish/news/exotics/exotics.html*.

Eurasian watermilfoil is an aquatic plant that forms dense mats in shallow areas and can interfere with fishing, boating, and swimming. **Brittle naiad** is another invasive aquatic plant that forms thick stands, out-competing or replacing native vegetation. Both can reproduce by stem fragments transported from one body of water to the next by boats, motors, trailers, or even birds. Check all equipment and remove and properly dispose of any "hitch-hiking" vegetation before you leave the body of water.

Purple loosestrife has invaded prairie wetlands and some Mississippi River backwater areas. It was introduced as a landscape plant because it has pretty purple flowers. It can crowd out all other plants leaving only a sea of purple.

Zebra mussels are small, striped mussels that attach to just about any surface and form huge colonies. They may be very small so can go unseen on wet equipment. Check all equipment before and after leaving any body of water.

Regulations and Ethics

Iowa has several boating regulations. For more information, see the *Iowa Boating Regulations* at *www.iowadnr.com/law/files/boat2003.pdf*.

Registration

Canoes and kayaks must have an Iowa Registration Certificate and decals to be operated legally on public waters. An exception to this rule are canoes and kayaks 13 feet or shorter with no engine or sail.

Registration numbers and decals must be:

- ✓ painted, decaled, or otherwise affixed to the forward half of each side of the craft;
- ✓ placed for maximum visibility;
- ✓ read from left to right on both sides; and
- ✓ at least three-inch high, bold, BLOCK letters.

The craft should be registered with the county recorder in the county of residence of the owner or county where the craft is principally used. There is a registration fee. If you have questions about registering a craft, call the Iowa Department of Natural Resources at (515) 281-5918.

Required Equipment

Personal Floatation Device (PFD)

All canoes and kayaks must have at least one United States Coast Guard (USCG) approved wearable (Type I, II, or III) PFD ("life jacket") for each person on board. If the canoe or kayak is 16 feet or longer, one throwable (Type IV) USCG approved PFD also must be on board. If paddlers are on the Mississippi or Missouri Rivers, or on federal reservoirs, children under 13 must *wear* an approved PFD. See "Personal Floatation Devices" in the **Safety** section for more information about PFDs.

To be "approved," a PFD must:

- ✓ have a legible USCG approval tag;
- ✓ be in good and serviceable condition (no torn or missing straps, punctured floatation bag, missing hardware, etc.);
- ✓ be readily accessible (paddlers can put them on quickly in an emergency); and
- ✓ be of the proper size for the intended wearer. (Sizing is based on body weight and chest size.)

Navigation Lights

Navigation lights are needed between sunset and sunrise and in periods of restricted visibility (fog or heavy rain). For canoes and kayaks, a lantern or flashlight shining with a white light will suffice.

Rules of Lakes and Rivers

Right of Way

The most frequently reported accident is a collision with another boat or object in the water. Carelessness or inattention is the most common cause for these collisions. Accidents can be avoided if paddlers pay attention and learn the rules of the "road."

If two crafts are meeting head-on or nearly so, both operators should alter their course to the right and pass at a safe distance. Unpowered crafts, like kayaks and canoes, generally have the right-of-way over powered crafts. However, large commercial crafts on the Mississippi and Missouri Rivers have the right away over smaller crafts because of their limited ability to maneuver.

U.S. Aids to Navigation System (ATON)

Buoys and markers are used as "traffic signals" on some waterways. They also can identify dangerous or controlled areas or give information.

Lateral Markers

These are used to mark the edges of safe water areas (e.g., to direct travel within a channel). They use a combination of color and numbers on buoys or permanent markers.

Nonlateral Markers

The most common nonlateral markers are white with orange markings and black lettering. They provide information, identify controlled areas (e.g., no fishing, no skiing, no wake), note areas off limits to crafts, or identify hazards (e.g., rocks, dams, stumps).

Paddling Ethics

Taking Care of the Resource

Part of the enjoyment of paddling is getting out in nature to observe scenery and wildlife. To some, this is the sole reason for paddling. Paddlers must protect natural resources so we can enjoy them today **and** tomorrow.

Wildlife is scared easily by humans. If animals are nesting, breeding, or seeking shelter, scaring them can create a dangerous situation for them or their young. Observe the following guidelines when watching wildlife:

- ✓ Paddle quietly.
- ✓ Don't splash paddles near wildlife.
- ✓ Keep a respectful distance (approximately 20 feet).
- ✓ Stay at least 100 feet from nesting sites.

Paddlers help aquatic resources when they leave the place better than they found it. Pick up all litter (yours and others). [Note: Do not attempt to pick up hazardous substances or disturb a meth lab. If something seems suspicious, don't touch anything. Note the location and contact local law enforcement officials immediately.]

Etiquette

Respect other paddlers. Keep voices down; sound carries over water. Obey all regulations for a particular body of water.

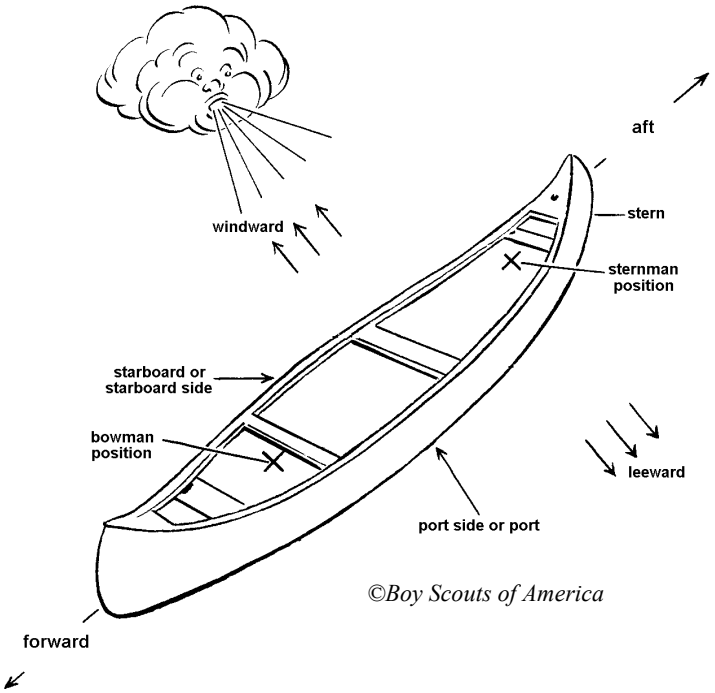
Paddling Equipment

Canoes and Kayaks

Before getting started, it is important to become familiar with common boating terminology. This will help you choose a craft appropriate for your program and teach the essentials of paddling.

Basic Paddling Terms

aft back part of craft
astern back part of craft
amidship center of craft
ballast weight that lowers center of gravity and adds stability
forward ahead; toward the front of the craft
leeward away from the wind
offside direction of a maneuver in which the craft moves away from the bow; designated paddling side
onside direction of a maneuver in which the craft moves toward the bow; designated paddling side
port left side of craft when facing the bow
powerface side of paddle blade pressed against the water during a forward stroke
starboard right side of craft when facing the bow
stern back part of craft
trim balanced from end to end and side to side; center of gravity over keels, below gunwales, and as near bottom as possible
windward toward the wind



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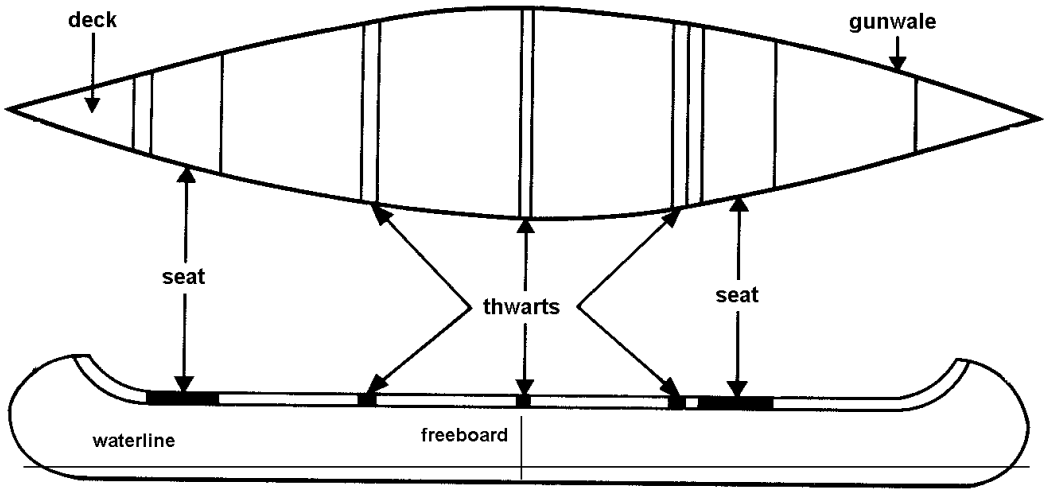
Parts of Canoe and Kayak

Canoe

deck panels at the front and back of the canoe
freeboard distance between surface of water and gunwale at the middle of the canoe
gunwale (pronounced "gunnel") - top edge/outside rim
keel reinforcing fin that runs along the centerline of the bottom; may be inside or outside
thwarts (pronounced "thorts") - braces that reach across top



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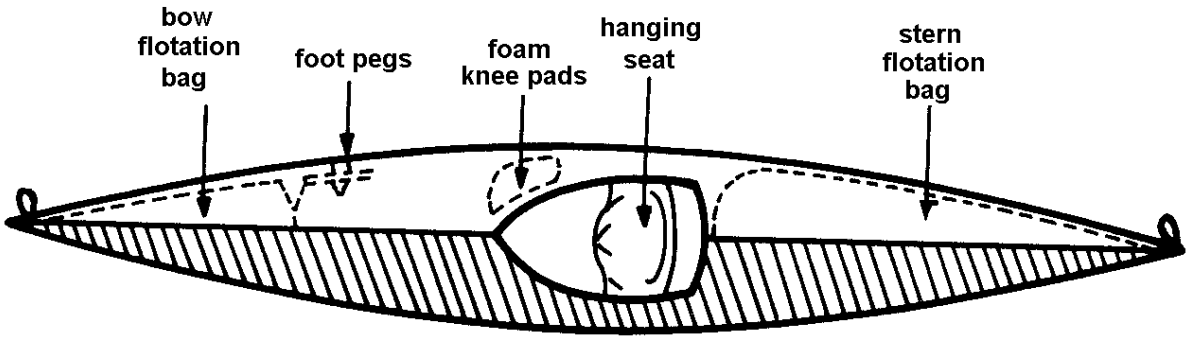
Kayak

braces/support walls made of waterproof foam; keeps deck from collapsing onto legs from pressure
floatation bag buoyant material that prevents kayak from filling with water
foam knee pads protect your knees and keep them from sliding around
foot peg used to place feet; may be adjusted to brace knees under side of deck



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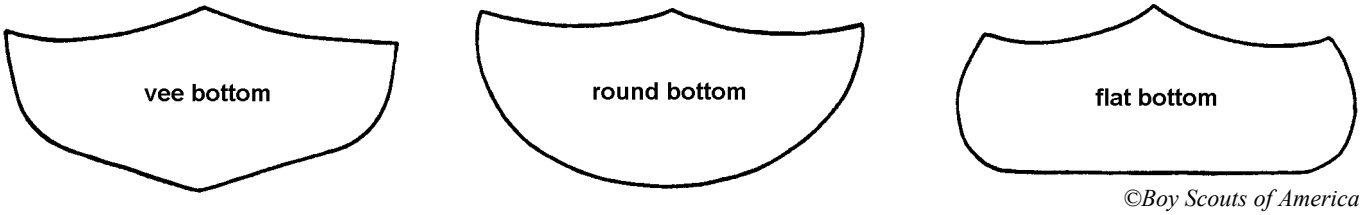
Characteristics of Crafts

Flare and Tumblehome

Flare and tumblehome refer to the shape of the craft above waterline. The gunwales of canoes with flared sides are curved outward to maximize stability. Canoes with tumblehome have gunwales that curve inward. This increases efficiency. Kayaks with a flared bow prevent waves from rolling into the craft. Modern kayaks typically do not have tumblehome.

Vees, Roundbottoms, and Flatbottoms

Vees, roundbottoms, and flatbottoms refer to the shape of the bottom of the craft. Flatbottom crafts feel stable upon entry, but may capsize easily in waves. Round and vee-bottom crafts are less stable initially, but become more predictable and controlled than flatbottom crafts. They also are easier to propel.



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Types of Canoes & Kayaks

There are three basic types of paddling: sea, flat water, and whitewater. Generally, Iowa's waters are flat water (lakes/ponds or slower rivers and streams).

There are four types of canoes for flat water paddling: recreational, touring, racing, and freestyle. Flat water kayaks can be split into three types: recreational, touring, and racing.

Type	Canoe Description	Kayak Description
Recreational	designed for a variety of purposes; stable, maneuverable, durable; lower performance than specialized crafts; low maintenance; can handle a moderate amount of gear; used by most educational programs; lengths vary	designed for a variety of purposes; stable, maneuverable, durable; lower performance than specialized crafts; low maintenance; can handle a moderate amount of gear; used by most educational programs; typically >15 feet long
Touring	faster, longer, & more narrow than recreational canoes; not as maneuverable; can carry a large amount of gear; typically 17 -18 feet long	can carry large amounts of gear; handle well; most have good stability; typically 16 - 18 feet long
Racing	longer & more narrow than other canoes; more streamlined; less maneuverable & stable; used by skilled canoeists for fitness and/or racing	built for speed; asymmetrical, widest point is just behind the cockpit; most have little stability; designed for skilled kayakers
Freestyle	used in freestyle paddling (strokes and maneuvers used to create a series of acrobatic moves);usually shorter than other types; often have more secondary stability to perform difficult moves	

Materials used in Canoes and Kayaks

Today's canoes and kayaks are more specialized than in the past. Both crafts now are available in natural and synthetic materials. The creation of Kevlar® and other plastic composites have increased maneuverability, lightness, and durability. Paddlers can choose from a variety of materials. The following chart compares materials used in canoes and kayaks.

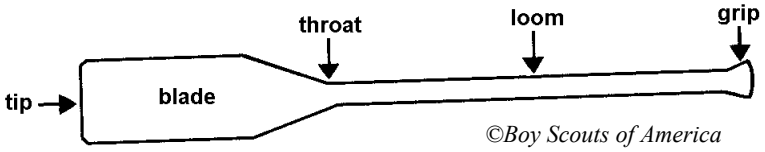
Material	Comment	Advantages	Drawbacks
Royalex®	thermoplastic laminate with plastic core	tough; excellent memory (pops back in shape if hits rocks); withstands severe impact	expensive; doesn't handle repeat abrasion (scratching) well
Kevlar®	tire cord fabric; used in bulletproof vests	very strong; lightweight	expensive; limited interior strength
Fiberglass	combinations of materials (Kevlar® included); much depends upon how built	durable; strong; lightweight	can be expensive
Aluminum	commonly used in education programs	lightweight; inexpensive; takes abrasion	shorter than 17' may paddle sluggishly; tends to "hang up" on rocks
Polyethylene	plastic; recent design includes foam core to make more durable	good durability; tough & forgiving to impact; more abrasion resistant than Royalex®	heavier than Royalex®; expensive (although less than Royalex®)
Wood Canvas	many educational programs use for historical purposes	appreciate in value; maneuverable	expensive (may be less expensive than plastics)
Cedar Strip	often used in racing	light; attractive; strong	expensive; less maneuverable

Paddles

Paddles are made of wood, aluminum, plastic, fiberglass, or combinations thereof. They should be light and strong. Canoe and kayak paddles are quite different in appearance.

Canoe Paddles

Canoe paddles are single bladed. The **blade** ranges from five to eight inches wide, and from 18 to 24 inches long.



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There are two types of **shafts** (a.k.a. **looms**), straight and bent. Straight shafts are easy to manipulate. Bent shafts are more efficient and powerful due to the built-in angle. This module assumes a straight shaft is used.

The **grip** of the paddle should fit smoothly and comfortably in your hand. There are two types of grips: T-grip and palm grip. The T-grip allows a firm grasp with precise control that can be used in all waters. The palm grip creates a better platform for hands and typically is used only on flat water.

The end of the blade is the **tip**. Tips sometimes are made of a stronger material than the rest of the paddle because it comes into contact with rocks, stream bottoms, snags, etc. The **throat** is where the blade attaches to the shaft.

Sizing the Canoe Paddle

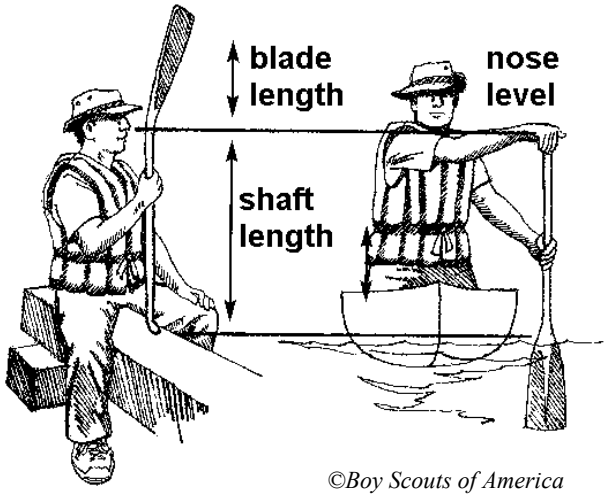
Paddles should fit their handler. The American Canoeing Association (ACA) recommends the following method for sizing an appropriate canoe paddle.

On the water:

- Sit comfortably in a canoe.
- Place the paddle perpendicular to the water surface with the blade submerged to the throat. The top of the paddle grip should reach between eye and nose level.

Without water:

- Sit upright on a flat surface.
- Place paddle grip between legs (on lap) and extend the blade upward.
- The throat of the paddle should reach the top of the head.



Kayak Paddles

Kayak paddles are long and double bladed. There are two types of kayak paddles: touring and whitewater. Whitewater paddles have a rigid shaft, wide blades, and typically are feathered (blades set at an angle to each other). This allows the paddler to have control while traveling through rapids. Touring paddles are designed for efficiency and comfort and are good for traveling Iowa's waters. They have a more narrow and smaller blade. Blades may be cupped (spoon) or flat. Flat blades are better for beginners.

Kayak paddles have either **right-hand** or **left-hand control**. This allows a designated hand to maintain a firm grasp on the paddle while controlling the angle of the blades. It also allows the shaft to rotate within the other hand between strokes and maintain a firm grasp during the stroke. Hand control is determined by the powerface of the blade. For example, if the power stroke is on the right side of the kayak, and the powerface of the opposite blade is facing up, then it is a right-hand control paddle. Most paddles sold are right-hand control.

Straight and bent **shafts** also are available in kayak paddles. Most beginners use straight shafts. There are two **throats** and **tips** in a kayak paddle because they are double bladed.

Sizing the Kayak Paddle

When sizing a kayak paddle, consider the type of paddling you will be doing, the width of the kayak, and your torso length. A general rule is that an average size paddler (5'2" - 6'2") in an average sized solo boat can use a 200-220 cm (80-88 inches) paddle.

Clothing

Dressing appropriately for paddling can mean the difference between a fun-filled float trip and a completely miserable experience. Paddlers should always dress for water temperature, not mid-afternoon air temperature. Dress includes both clothing and accessories. The following chart lists items needed for paddling.

Dressing for Paddling

Item	Benefits
personal flotation device (pfd)	keeps you afloat following unexpected accidents
loose layers of clothing	keep in heat in cold weather; can be shed or added as temperature changes
wool and synthetic clothes	good insulation, even when wet; dry much more quickly than cotton
light-colored cotton clothes	reflect sun's rays in warm or hot weather & absorb perspiration
hat	keeps in heat in cold weather; protects head from sun's rays in hot weather; shades eyes
sunglasses	block reflected sunlight, protect eyes, & help vision
sunscreen	partially blocks sun's rays, especially ultra violet (U-V); helps prevent sunburn
shoes	protect feet from rocks and other obstructions; help prevent slipping
helmet	protects head from hitting rocks & other obstructions while kayaking or canoeing rivers
wet suit	keeps body warm and dry when kayaking

Miscellaneous Equipment

Item	Description
spray skirts	attached to the cockpit in kayaks; prevent water from flooding the craft; made of nylon or neoprene; fit around the paddler's waist; a quick-release tab allows a quick bail out
painters	ropes that may be tied to the bow or stern of the craft; should be made of nylon to hold up in water; should be secured somewhere in the boat while not in use (e.g. tied to the nearest thwart, coiled and secured to the breastplate) to ensure safety of the paddler
bailers	used to take water out of the bottom of a canoe; can be buckets, the bottom of a gallon plastic jug, or a large sponge; should be tied to a thwart in case of capsize
knee pads	may be used when paddling in the kneeling position; rest on the bottom or are secured to paddlers' legs; should not slip on the bottom or soak up water; may be purchased or made
duct tape	may be the paddler's best friend; can be used to repair tears, holes, or splintered paddles or secure painters
waterproof containers	all gear should be stored in these; may be plastic bags closed with a gooseneck (twist and bend over the top, wrap with a rubber band) or specialty purchased canoe packs; gear should be kept in the center of the canoe with its weight distributed evenly; in case of capsize, gear tied to a thwart will be easier to recover

Canoe Paddling

One or two people (solo or tandem) can paddle a canoe. Most instructors feel tandem canoeing should be mastered before trying to paddle solo. For this reason, this module focuses on tandem paddling.

In tandem paddling, one person is in front (bowman) and the other is in back (sternman). Each paddler has duties she is responsible for. The bowman reads the immediate route on the water, makes necessary commands or maneuvers to avoid hitting obstacles, and sets the pace for strokes.

The sternman matches the timing and speed of the bowman's strokes to make paddling more efficient and easier to control. She follows the general course of the river/lake, maintains or changes craft alignment, and maintains adequate spacing between other crafts.

Positions

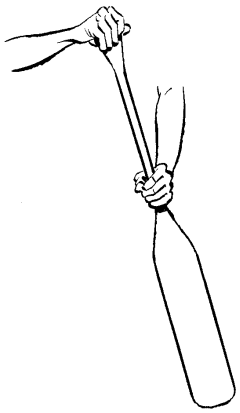
There are two basic positions for paddling in a canoe, sitting and kneeling. When kneeling, the paddler wedges his knees against the sides and rests his weight against the front edge of the seat. When sitting, the paddler sits on the seat, bracing his knees against the gunwales.

Both positions have benefits and drawbacks. Kneeling increases the canoe's stability by lowering the center of gravity. It allows paddlers to use thigh and trunk muscles more efficiently in conjunction with their arms and shoulders. It also allows paddlers to get a wider reach and a more powerful stroke. However, kneeling may not be comfortable, making paddling less enjoyable.

Sitting is more comfortable and is good on quiet water. Sitting raises the center of gravity and reduces the canoe's stability. When sitting, paddlers primarily use their arm and shoulder muscles and have a harder time using muscles in their thighs and trunk. Most of these disadvantages can be overcome by practice and paddling correctly. For the purposes of this module, paddling will be taught in the sitting position.

Holding the Paddle

- ✓ One hand goes on the grip, the other on the shaft near the throat.
- ✓ To hold the grip, lay your hand on top with palm down and fingers outstretched. Close your hand so fingers are on one side, the base of your hand is on the opposite side, and your thumb wraps around.
- ✓ To hold the shaft, open your other hand, with palm down and fingers spread. Lay the throat of the paddle between thumb and index finger and close your hand. Hands should be shoulder width apart.
- ✓ To paddle on the port side, place your right hand on the grip and your left hand near the throat. To paddle on the starboard side, do the opposite.



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Parts of a Stroke

The ACA recognizes three parts to every stroke:

1. **Catch** - blade is first inserted into the water, power has not been applied
2. **Propulsion** - working part of the stroke that should accomplish the objective (makes progress, performs the maneuver); paddler uses her torso more than her shoulders or arms
3. **Recovery** - the blade exits the water and is moved to the catch position of the next stroke; paddlers should feather the blade (twist the wrist to align the blade with the surface of the water) to minimize resistance

Basic Strokes

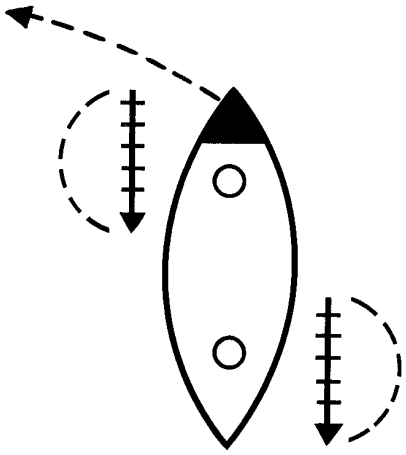
The basic concept of a stroke is simple. When the paddle is planted in the water and the paddler pulls, he is pulling self and canoe to the paddle. Many strokes may be performed to move the canoe in the proper direction.

Forward Stroke - moves the canoe forward; should be kept short to maximize power; paddle should be parallel to keel and as close to keel as possible; if done properly, canoe will go the opposite direction of the side the sternman paddles

Catch: paddler rotates torso 45° offside; both arms forward and hands across gunwale; shaft arm should be outside gunwale with shaft vertical; paddle should be two feet in front of onside knee with full length of blade in water

Propulsion: paddler uncoils his torso to face forward; lower arm pulls paddle while upper hand pushes; stroke kept parallel to keel, not gunwale

Recovery: stroke ends at paddler's hips; blade taken out of water and feathered; paddler gets ready for next catch position



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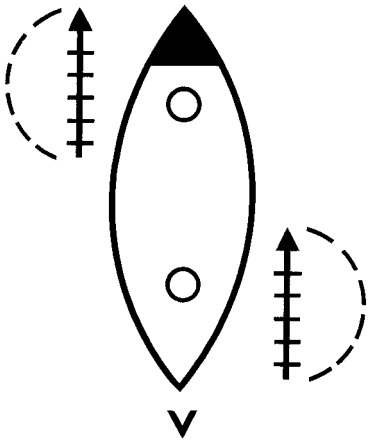
Back Stroke - stops forward motion and/or moves canoe backward; essentially the opposite of forward stroke; stern paddler should be able to steer canoe as it moves backward

Catch: paddler rotates 45° onside; paddle placed in water just behind her hip; shaft vertical and both arms slightly bent

Propulsion: paddler uses her torso to drive backface of paddle forward toward bow; stroke is parallel to keel, not gunwale

Recovery: stroke ends at paddler's knees; blade is left in the water for recovery; turn paddle by rotating thumb to slice through water back to catch position



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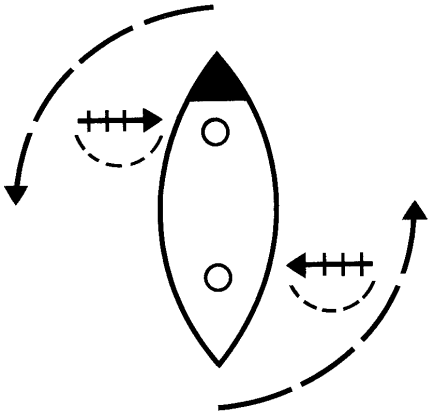
Draw Stroke - moves craft sideways toward paddle; has a righting effect which makes it hard to capsize the canoe; basically forward stroke done perpendicular to keel (not parallel); when teaching, have students imagine paddle as a broom sweeping water underneath the canoe

Catch: paddler turns onside, lining shoulders with centerline of boat; both arms extended away from body at paddler's hips; blade parallel to keel, powerface toward canoe

Propulsion: paddler uses torso to pull onside hip toward paddle; lower arm pulls paddle and upper arm pushes

Recovery: stroke ends before paddle touches canoe; blade may either be left in or out of water



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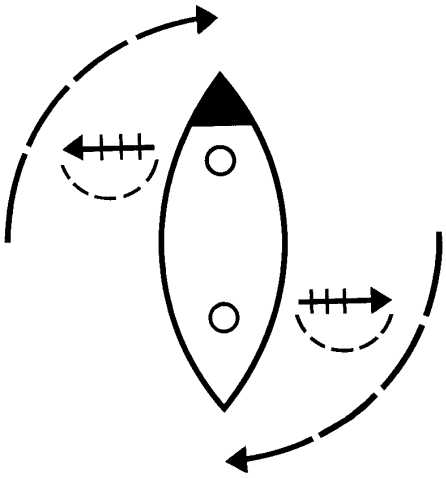
Pry Stroke - moves canoe forcefully away from paddle; essentially the opposite of draw stroke; should not be used in shallow water because paddle may catch on rocks, capsizing the canoe

Catch: paddler turns onside, lining shoulders with centerline of boat; both arms slightly bent; paddle kept close to canoe; blade parallel to keel and shaft angled under canoe

Propulsion: paddler uses torso to push onside hip away from paddle; lower arm pushes away from, while the upper arm pulls toward paddler; canoe pried away from blade

Recovery: stroke kept short with shaft nearly vertical throughout; ends away from canoe; blade may either be left in or out of water



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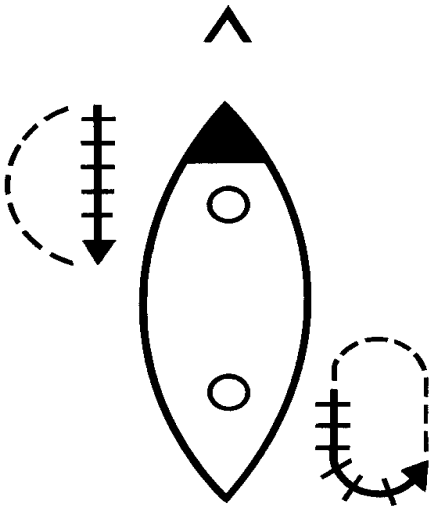
J-Stroke - performed by sternman; used to keep canoe going straight during forward movement; similar to forward stroke with a variation at end of propulsion stage; should be kept short; paddlers should be aware it will slow their momentum a bit; sometimes more difficult for students to learn

Catch: paddler rotates torso 45° offside; both arms forward and hands across gunwale; shaft arm outside gunwale with shaft vertical; paddle approximately two feet in front of onside knee with full length of blade in water

Propulsion: paddler uncoils his torso to face forward; lower arm pulls paddle while upper hand pushes; stroke kept parallel to keel, not gunwale; when paddle reaches paddler's hips, he twists upper hand so his thumb points forward; shaft hand pushes blade away from boat; makes shape of the letter "J"

Recovery: blade lifted out of water



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Minnesota Switch or Hut Stroke - used by both paddlers to maintain a straight course; paddlers switch sides every six to eight strokes while performing forward stroke; remove paddle from water, reverse hand positions, (shaft hand goes to grip and grip hand goes to shaft) and place paddle on other side of canoe; stern paddler calls the switch because she can see better and more quickly the canoe's changing course; sternman also can see if bowman has heard command and switched

Stern Rudder - another way to keep canoe going in a straight line; sternman places paddle in water parallel to canoe and angled back; turn grip hand in direction canoe should go

Kayak Paddling

Like canoe paddling, each stroke has three parts; catch, propulsion, and recovery. However, there are many differences with paddling a kayak:

- Kayaks are typically solo crafts.
- The kayak paddler must assume responsibility for duties of both tandem canoeists.
- Kayaks are more likely to tip.
- The double blade of the kayak paddle allows kayakers to paddle on both sides without having to switch.

Paddling Positions

Paddlers should sit straight when kayaking. This allows a broader range of movement and an increase in strength to perform strokes and maneuvers.

Boat lean helps kayakers feel the stability of their craft. It occurs when a paddler pulls one knee up, while simultaneously pushing down with the opposite hip and keeping his body weight above the kayak. This transfers weight to the hip and allows the paddler to balance on that hip. This will move the craft underneath him.

Paddling a kayak involves a push-pull action against the paddle (similar to boxing). When going forward, kayakers punch out with their upper arms and pull back with their lower arms. This creates a need for kayakers to rotate their body, while keeping their trunk and shoulders facing their hands.

Holding the Paddle

Grip the paddle in the palm of your hands rather than your fingers. This makes it easier to cock your wrists and gives you better control over the paddle. Your hands should be at a greater width than your shoulders. Your elbows are at a 90° angle to your forearms, which are approximately a 70° to 90° angle to the paddle shaft. An easy way for beginner kayakers to remember their hand position is to tape their proper grip location on the paddle.

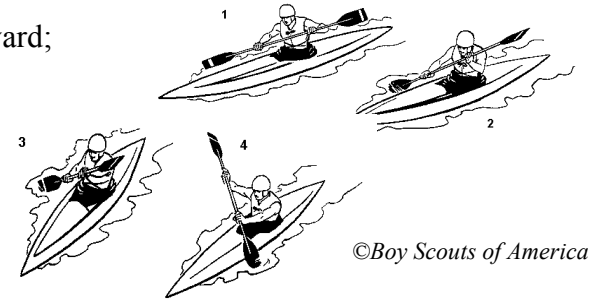
Basic Strokes

Kayak strokes follow the same basic concept as canoe strokes: when the paddle is planted in the water and the paddler pulls, she is pulling self and canoe to the paddle. The power in kayak strokes comes from the push of the upper hand, twist of the torso, and pull of the lower hand. The use of all three will provide smooth, quick, strong strokes.

Forward stroke - moves kayak forward; blade should be completely in water and paddle parallel to centerline; paddler's upper hand should not cross center line or stroke will be too long; craft will naturally turn, so beginners need to practice timing and power

Catch: paddler's torso rotates with right shoulder forward; blade inserted in water close to kayak

Propulsion: upper hand punches out toward grab loop on bow while lower arm pulls, rotating paddler's body; upper hand continues to punch out to full extension of her arm while upper body follows through to full rotation; lower arm comes to paddler's hip



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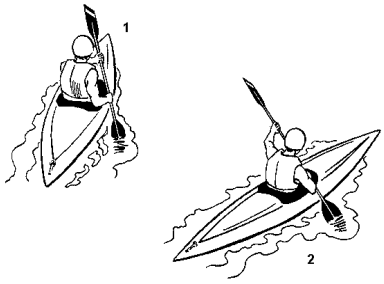
Recovery: paddle blade removed from water by quickly lifting wrist and elbow to shoulder level allowing a clean exit and quick recovery; torso rotated with left shoulder forward and ready for catch position on opposite side

Back stroke - slows/stops moving kayak and/or moves it backward; essentially the reverse of forward stroke; beginners should look back over one shoulder to ensure paddle stays parallel to centerline

Catch: paddler's torso rotates with left shoulder back; upper hand in front of head with arm bent approximately 90°; lower arm at paddler's hips; left paddle blade in water close to craft

Propulsion: lower hand pushes forward while upper hand simultaneously pulls back; left shoulder rotates to forward position; right arm moves to paddler's shoulders

Recovery: paddle blade removed from water by quickly lifting wrist and elbow to shoulder level; torso rotated with right arm at paddler's hips and ready for catch position on opposite side



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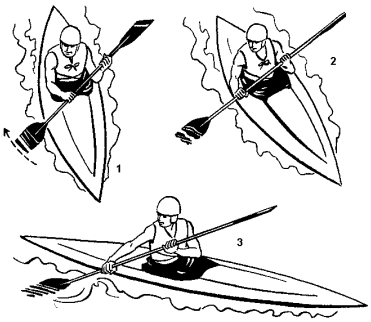
Forward sweep stroke - turns bow of kayak to opposite direction paddled while maintaining forward movement (e.g. a sweep on the right turns the bow to the left); paddle moves in an arc from bow to stern; paddle blade should be fully submerged throughout propulsion; useful for moving around obstacles; encourages paddlers to use good boat lean

Catch: paddler's torso rotates with right shoulder forward; blade inserted in water close to kayak; lower (right) arm more straight than upper arm, making torso "wound up"

Propulsion: the upper hand pushes forward while lower simultaneously pulls paddle back in a wide half circle; shoulders face paddle shaft while maintaining a parallel position

Recovery: paddle removed from water similarly to forward stroke



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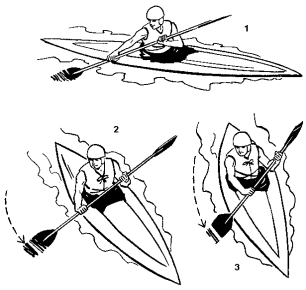
Reverse sweep stroke - slows forward motion of kayak as it turns craft toward side on which stroke performed; essentially the reverse of forward sweep stroke

Catch: paddler's torso rotates with left shoulder back; left blade inserted in water close to kayak and behind paddler; beginners should look over their shoulder to see where blade is inserted

Propulsion: upper hand pulls back while lower simultaneously pushes forward in a wide half circle

Recovery: paddle removed from water similar to back stroke



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Draw stroke - pulls boat sideways without slowing forward momentum; done at midship

Catch: both of paddler's hands extended over water; upper hand reaches farther out, making paddle nearly perpendicular to water; blade face turned toward kayak before it is inserted in water

Propulsion: paddler pulls boat to blade using both arms, keeping paddle nearly vertical; lower hand applies most of the force

Recovery: stroke ends when blade is near craft; blade feathered out of water and placed in catch position

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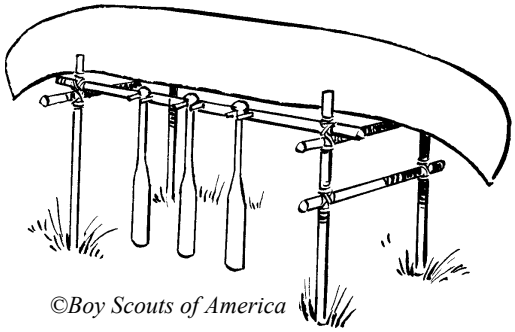
Launching and Landing the Craft

Canoes and kayaks often are brought to the launching site on trailers with racks.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Trailer Safety Tips

Before leaving home

- ✓ Make sure the craft is secured properly on the trailer.
- ✓ Inspect all lines and tie-downs. Tighten as necessary and replace any that show signs of damage.
- ✓ Make sure all trailer lights are operating correctly.
- ✓ Test the brakes.
- ✓ Inspect the hitch and safety chain.
- ✓ Check tire pressure and lug bolts.

While on the road

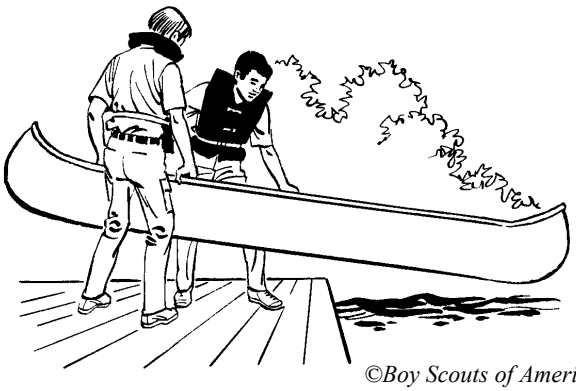
- ✓ Drive carefully, allowing for the extra length of the car and trailer when turning and passing.
- ✓ Allow more time for stopping.
- ✓ Watch speed limits.
- ✓ Pull off the road periodically to check tires and wheel bearings for overheating. Test the tie-downs and check any gear carried in the craft.

Taking crafts off the rack

1. Make sure there are no obstructions on the ground.
2. Two people (one at each end) should lift the craft off.
3. Hold the deck and keel securely.
4. Step sideways until the craft is clear of the rack and there is open ground under it.
5. Carefully turn the craft upright and set it on the ground.

Transporting the craft to water

1. Stand on opposite sides of the deck or at the first thwart from the bow and stern.
2. Grasp it under the deck, or at the thwarts, and stand together.
3. Lift the craft with your legs, keeping your arms straight.
4. Place the craft in approximately six inches of water with few rocks underneath to prevent scratching.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Most upsets occur during launching or landing. Always wear a PFD when paddling. To prevent capsizing, keep your weight bearing foot on the centerline and balance the craft from side to side by transferring your weight to your hands. Maintain three points of contact while entering or exiting a craft, one hand and two feet or two hands and one foot.

Launching a canoe from shore

1. Place paddles in the canoe.
2. One paddler (A) should hold the canoe steady while the other (B) gets in. To steady the canoe, sit on the breast plate with legs on either side bracing it or kneel at the bow or stern with one knee on either side and grasp the canoe with your arms across the breast plate.
3. Paddler B places her hands on the gunwales for support while entering. She must keep her weight centered and low (keep your bottom down) while moving.

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4. Once Paddler B enters, she holds a paddle against the river/lake bottom to steady the canoe.
5. Paddler A places his hands on each gunwale and climbs aboard. He enters the canoe the same as Paddler B. Paddle away from shore.

Launching a canoe from a dock

1. Partners place the canoe gently into the water parallel with the length of the dock (one gunwale against side of dock).
2. Paddler A kneels/sits on the dock and holds the canoe steady while Paddler B puts the paddles in.
3. Paddler B puts his feet in the canoe. With one hand on the dock, he grabs the gunwale on the opposite side and moves to his position.
4. Once Paddler B is in the canoe, he holds the dock to steady the canoe.
5. Paddler A gets in following the same procedure.
6. Push off from the dock.

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Launching a kayak

1. Place the paddle across the back of the cockpit with one blade on shore or dock.
2. Grasp the center of the paddle and back edge of the cockpit with one hand and ease into the kayak.
3. If the kayak has a spray skirt, attach it to the lip.
4. Paddle away from shore/dock.

Reverse the launching steps to land a craft. Approach docks/shores carefully, looking for obstructions so you don't run aground.

Float Plan

Good planning and preparation can help your trip run more smoothly and provide alternatives in case of an emergency. Float plans are a good idea for all trips, but they are essential for longer trips or group trips. Some things to consider include:

- Obey all state and local regulations.
- If your travel route includes private property (only for non-navigable streams), get written permission before crossing and minimize impact on the land. (See "Paddling Ethics - Taking Care of the Resource" in the **Regulations and Ethics** section.) According to Iowa Code, all members of the public may float on any stream that is navigable and fish, swim, and wade in its waters. Navigable waters include all streams capable of floating a craft with one person aboard during six months in one out of ten years. Paddlers cannot be prosecuted for criminal trespass if they are boating, fishing, or wading in the bed of a navigable stream. However, land on either side of the stream is private property. Obtain permission from the landowner if you want to exit the river.
- Find optional take out points (places to take the craft out) in case of emergency, bad weather, or slower than expected progress. Place a vehicle with first aid equipment, dry clothing, and food at each location.
- Drop off and take out points must accommodate transport vehicles. Include current maps and information about waterways to be traveled. Mark the planned course and label drop off and take out positions.
- Give a generous estimate of travel time.
- Review the completed plan with others who have traveled the course recently.
- Give a copy of the (written) plan to someone not traveling along with whom you can check you're your return.
- The day of the trip, check the route (for changes) and the local forecast (for severe weather). If weather becomes rough or dangerous river conditions arise, get off the water immediately.

River Reading Skills

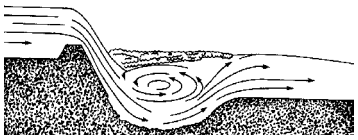
Water flows downhill. The steeper the terrain, the faster the water current (velocity). A large volume of water and narrow river width also increase velocity.

In their natural state, streams and rivers meander (turn or wind), changing their course over time. Meanders create pools, runs, and riffles. Pools are deeper with slower water. Runs are more shallow with faster current. Riffles are the most shallow with the fastest current. The water surface in a riffle is broken up from flowing over rocks. Different sections of rivers and streams have varying speeds. Water in meanders flows faster and is deeper on the outside of a bend. On straight sections of rivers, water moves fastest in the middle.

River paddling involves different skills than paddling a lake, pond, or wetland. You must handle your craft in current and avoid hazards such as rocks or overhanging trees. There are many potential hazards in a river. Following are commonly found in Iowa.

Potential River Hazards

low head dam constructed river hazard; recognized as a horizontal line; creates a hole when water flows over an obstacle and lands on the water's surface; downstream surface water rushes upstream to fill the depression, creating a vertical whirlpool (hydraulic) which often is inescapable; portage around to avoid its dangerous hydraulic downstream



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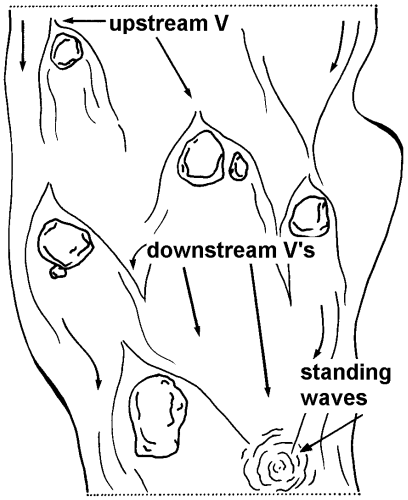
overhanging obstacles trees, cables, brush, etc. that can trap debris while allowing water to pass through; the force of water rushing through can pin people and canoes under

large submerged boulders natural river hazard; may have a hydraulic similar to low head dams

fences in Iowa, owners of a navigable stream bed have a right to erect a fence across the stream to keep livestock in, while affording boaters safe passage

River Paddling Hints:

- Look down river as far as possible before it flows out of sight. Find the best channel and follow it back to the craft.
- Follow downstream "V's" (point away from you) on the water surface. Upstream "V's" (point toward you) indicate rocks and should be avoided.
- Scout potentially hazardous sections on land. If unsafe, portage around them.
- Always travel a river or stream before taking a group on it.



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Safety

Selecting the Right Water

When selecting a water for beginning paddle trips, safety should be the first priority. Avoid traveling on large rivers due to faster current and more potential hazards. Avoid windy days due to potential capsizes caused by waves. Also avoid high waters because of the increase in current and debris floating in the water.

Personal Floatation Devices

Personal Floatation Devices (PFDs) are a must for every paddler. Iowa law mandates a U.S. Coast Guard approved wearable PFD in good condition be available to every person in a canoe or kayak. Not only is it the law, it makes good sense. Paddlers are more likely to go into the water than any other type of boaters. Accidents can happen at any time without warning and life-threatening accidents often occur in seemingly shallow water.

For more information about Iowa requirements see the *Iowa Boating Regulations*: *www.iowadnr.com/law/files/boat2003.pdf*.

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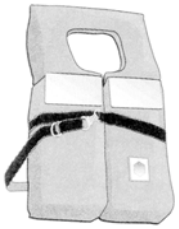
Types of PFDs

 *©2004 Boat Ed*	**Type I** - offshore life jackets; have the most buoyancy; geared for rough waters where rescue may take awhile; turn most unconscious wearers from a face down position to a vertical/slightly backward position; bulky & uncomfortable to wear
©2004 Boat Ed	**Type II -** near shore buoyant vests; often orange; have a collar; turn some unconscious wearers from a face down position to a vertical/slightly backward position (provided there is some movement of water); more comfortable than Type I
©2004 Boat Ed	**Type III -** commonly used in paddling due to their comfortable design; will keep conscious persons vertical and slightly backward; designed for use where a quick rescue is likely
©2004 Boat Ed	**Type IV -** designed to be thrown to a person in water, not worn; typically cushions or rings

Wearing a PFD

A PFD is only effective if it is worn correctly and fitted properly. All PFDs should be worn with the label on the inside and belt straps adjusted so it fits snugly. A simple way to tell if it fits is to try the PFD on and close the zipper and/or cinch the ties. Have a partner grasp the vest by the shoulders and pull as high as they can. If the PFD rides up over your ears, it is too big and should not be worn.

Care and Storage

Improper care and storage of PFDs can quicken their demise. They should be dried off the ground and out of sunlight. Direct sunlight causes fabric to fade and dry out. All buckles, zippers, and ties should be maintained and repaired and labels should be readable. If floatation material or fabric is damaged, throw it out and replace. PFDs should not be used as seat cushions or kneeling pads. Do not leave them in places that get extremely hot (e.g., car trunks).

Other Safety Tips

Helmets: Iowa law does not require paddlers to wear a helmet. Helmets protect your head from hitting rocks or other obstructions in case of capsize or rolling and should be worn when paddling rivers or using kayaks.

Paddle in Groups: Never paddle alone. Check in with someone at specific intervals during an extended trip. Stay on the planned route/path. If an injury occurs, help can arrive faster if they know where to look.

Weather: Lightning, strong winds, hail, and heavy rain make trips miserable and can be dangerous. If lightning or other dangerous weather approaches, get off the water and seek shelter. Always paddle into wind and waves. This makes the craft more stable and allows you to see approaching waves.

Swimming Ability: It is a good idea to know how to swim, but the best protection in the water is a PFD.

Map Reading Skills: It is important to be able to read a map, especially when you are on unfamiliar water or an extended trip. For more information about map reading, see the **Know Where You Are** section in the *Background Information* of the *Introduction to Outdoor Skills* module: *www.iowadnr.com/education/files/osbckinf.pdf*

Hypothermia: The body can be chilled beyond its ability to re-warm itself. The first symptom is shivering. Later symptoms include blue lips, loss of feeling in extremities, and eventually the absence of shivering and extreme fatigue. If not checked, it can cause death. Contrary to popular belief, hypothermia can occur at almost any temperature once the body is chilled by wind or wetting.

Hypothermia Chart

Water Temperature (measured in degrees Fahrenheit)	**Exhaustion or Unconsciousness Occurs**	**Expected Survival Time**
32.5	under 15 minutes	under 15 - 45 minutes
32.5 - 40.0	15 -30 minutes	30 - 90 minutes
40 - 50	30 - 60 minutes	1 - 3 hours
50 - 60	1 - 2 hours	1 - 6 hours
60 - 70	2 - 7 hours	2 - 40 hours
70 - 80	3 - 12 hours	3 - indefinitely
over 80	indefinitely	

To prevent hypothermia...

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- Dress for water temperature, not mid-afternoon air temperature.
- Wear clothes that dry quickly (see "Clothing" in the **Paddling Equipment** section).
- Positions to reduce heat loss:
  - ✓ Heat Escape Lessening Posture (H.E.L.P) – single swimmer; cross legs at ankle and pull toward chest; cross arms at chest (protecting the area under the arms) or hold neck with hands; keep head above water at all times.
  - ✓ Huddle position - more than one swimmer; swim together to form a circle; wrap arms around one another and keep legs together; keep heads above water at all times.
- The best treatment for hypothermia is to remove wet or cold clothes and replace with warm, dry clothing or blankets. Immediately call for an ambulance or other medical help (even if the condition is in early stages).

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Rescue Techniques

Do not panic if your craft capsizes. A canoe probably will eject both paddlers on the same side. A kayak probably will turn over without releasing the paddler. If your craft overturns, fall out. Your PFD will keep you afloat.

Swim Craft to Shore

Canoes and kayaks have built in floatation. Even if they fill with water, they float. After being ejected from the canoe or bailed out of a kayak, swim back to the craft. If it is an overturned canoe, position one paddler on each side. Work together to turn it upright. If it is a kayak, hang on to the boat and pull it along side or wade back to shore.

In moving water, stay on the upstream side of the craft to prevent entrapment between a rock and the craft. If possible, stay with the craft because of its floatation and visibility to other boaters and rescuers. If others are not available to throw a line, ride the river until you can swim to shore.

Float to Safety

If you can't stay with the craft and the water is too deep to stand, float on your back with your *feet pointing downstream*. This will protect your head from hitting obstacles. Do not stand unless water is less than knee deep to prevent being caught in underwater snags or obstacles.

Re-entering a Canoe

Swim or wade back to the overturned canoe. Position one paddler on each side. Work together to turn the canoe upright. To get back in, one person should be just forward of midship, the other just aft of midship. If you are in deeper water, move at the same time and kick sharply to pull yourself up on the gunwale until your arms are straight and the gunwale is below your waist. If one person falls off, the other should too to prevent capsizing again. When the gunwale is below your waist, lean into the canoe and roll over so you fall in bottom first. To eliminate confusion, one person commands while the other responds.

If you are unable to get in at the same time, take turns. One person stays in the water and adjusts his weight on the gunwale to balance the canoe. Once the first person is in, the second person gets in. The person in the boat can lean to the side to balance the weight.

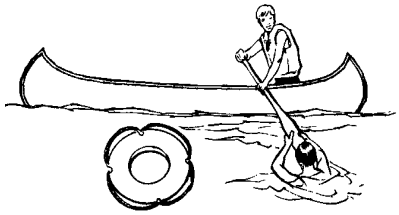
When both are in, paddle to shore. If the canoe is full of water it will be hard to get going. However, once it gains momentum, it is hard to stop due to the weight of water. When you reach a stopping point, get out slowly and walk, swim, or tow it to shore.

Righting a Kayak

Righting a kayak involves a maneuver called the Eskimo roll. This maneuver is difficult for beginners. For this module, if a kayak rolls, the paddler should exit. For more information on Eskimo rolls and other advanced kayak techniques, refer to the *Boyscouts of America Fieldbook* or the ACA *Canoeing and Kayaking Instruction Manual* in the *Additional Resources* section.

Assisted Rescues

Assisted rescues are more challenging than self rescues. Swimmers occasionally become frantic and capsize their rescuers. Approach capsized swimmers cautiously. Keep your canoe between you and them. Make sure everyone is safe before attempting to recover canoes or equipment.



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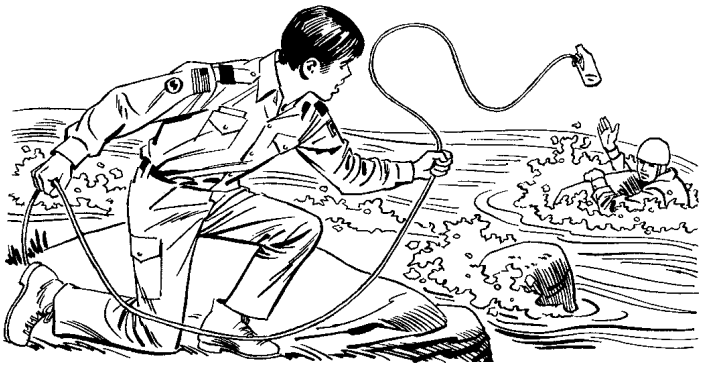
Listed below are easy assisted rescues. Rescue techniques change constantly. To keep up to date or to learn more methods contact the American Red Cross, American Whitewater Association, or the ACA.

Tow to Shore

The simplest way to rescue swimmers is tow them back to shore. Swimmers return to the overturned canoe and wait for rescuers. When rescuers approach, swimmers hang on to a painter attached to the stern to be towed to shore.

Reach, Throw, Row, Go

Try reaching the victim with a hand or paddle. If he is too far away, throw him a float or rope. If he is beyond throw range, maneuver a boat into position for reaching or throwing. Never enter the water to pull out a swimmer. Call for help. Only a trained/equipped rescuer should swim to aid.



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Activities: Background

A Look Back – The History of Canoeing and Kayaking

Overview:
Students are acquainted with the history of canoeing and kayaking through a brief discussion or research.

Associated Objectives:
- ❑ Students will be acquainted with the history of canoeing and kayaking.

Time:
15 minutes; time for research if included

Materials:
If research is included – access to library and/or Internet

Directions:
Refer to **Paddling Then…** and **Paddling Now…** sections of the *Background Information* to learn more about the history of canoeing and kayaking. Ask students what they know about how these boats originated and how they might have been used in earlier times. Discuss their knowledge and share the brief introduction included in this module.

Alternate: Have students share their knowledge of canoes and kayaks in history. Assign pairs to research these crafts through print media and/or the Internet. Students can share what they learn through written or oral presentations. (Note: For best results for Internet searches type in specific key words [e.g., history, canoe, kayak, North America, Native Americans] depending on the craft/culture/geographic area you want to know about. Also, make sure students check out the source of any web sites to verify accuracy of information.)

Evaluation:
Students should be able to convey that canoes and kayaks originally were developed as utilitarian crafts and have evolved into recreational crafts.

Extensions:
Students may do extended research on the role of canoes and/or kayaks in different cultures.

Looking to the Future – Our Impact on the Resources

Overview:

Students learn about how we impact natural resources through our actions and determine a "code of ethics" to reduce negative impacts and improve our natural resources for future enjoyment.

Associated Objectives:

- ❑ Students will be acquainted with ways humans interact with natural resources including individual responsibility toward natural resources.
- ❑ Students will develop a set of guidelines for ethical conduct for canoeing and kayaking trips.

Time:

30 – 45 minutes

Materials:

Writing materials, flip chart or chalk board; Optional: canoe/kayak registration, craft, and required gear

Directions:

Refer to **Iowa's Aquatic Resources**, **Issues Facing Our Aquatic Resources**, and **Regulations and Ethics** sections of the *Background Information* for brief synopses of these topics.

Ask students:

Where might you canoe (or kayak)?

Briefly discuss the major types of waters in Iowa. You might also discuss nearby public access areas for each type of water. See the *Iowa Canoe and Fishing Stream Access Guide* for information about public access points on rivers. The *Iowa Lake Fishing Guide* has information about public lakes. This information also is available through the DNR web site: *www.iowadnr.com/fish/fishing/2004LakeFishingGuide.pdf.*

Ask students:

What are some negative impacts to Iowa waters?

You can have them create individual lists and then share, or do this as a group. List impacts on a flip chart or chalk board so everyone can see the list. Be sure to add any from the *Background Information* students do not list. Discuss the impact – what causes it; how it can be reduced or prevented.

Provide students a copy of the "Quick Canoeing Facts" handout. Briefly discuss the regulations related to registration and required equipment for each craft.

Optional: Have a canoe or kayak with required equipment for students to view. Include items that are not required or do not meet requirements (e.g., a non-approved PFD, cooler, seat cushions, rope, fire extinguisher). Have students determine items that are required/meet requirements. Discuss their selections. Briefly review the basic regulations for canoes/kayaks. Distribute the "Quick Canoeing Facts" handout and/or copies of the current *Iowa Boating Regulations*.

Present the idea of an ethic vs. a regulation or law. Violating a regulation or law has legal ramifications. Actions based on ethics are voluntary. Most boating regulations/laws deal with safety issues. Ethical conduct shows respect for others and the resource.

Discuss how canoeists should conduct themselves on the water to minimize impacts on the natural resources (wildlife and waters). Develop a "code of conduct" for students to follow. Create a master list for the group. Keep the list short and simple, so everyone can remember it. If students have notebooks or journals, have them copy the "code of conduct" in these.

Evaluation:

Students will be able to identify different types of waters in Iowa and provide nearby examples of each. Students will be able to identify negative impacts on Iowa's aquatic resources and ways to reduce or prevent those impacts. Students should be able to express requirements for registration and equipment for canoes/kayaks in Iowa (either verbally, or by identifying these on an actual craft). Students will develop a "code of conduct" to follow during canoeing/kayaking.

Quick Canoeing Facts

Following is a brief list of requirements for canoes and kayaks related to registration and equipment. Iowa has several boating regulations. For more information, see the *Iowa Boating Regulations* at *www.iowadnr.com/law/files/boat2003.pdf.*

Registration

- ✓ must have Iowa Registration Certificate and decals on public waters unless ≤ 13 feet with no engine or sail
- ✓ register with county recorder in county where owner lives or county where craft principally used
- ✓ registration numbers and decals must be:
  - o painted, decaled, or otherwise affixed to forward half of each side of craft
  - o placed for maximum visibility
  - o read from left to right on both sides
  - o at least three-inch high, bold, BLOCK letters

Required Equipment

Personal Floatation Devices (PFD)

- ✓ at least one United States Coast Guard (USCG) approved wearable PFD for each person on board
- ✓ >16 feet, one throwable USCG approved PFD also
- ✓ on the Mississippi or Missouri Rivers, or on federal reservoirs, children <13 must *wear* approved PFD
- ✓ "Approved" PFD must:
  - o have a legible USCG approval tag
  - o be in good and serviceable condition
  - o be readily accessible
  - o be of the proper size for the intended wearer

Navigation Lights

- ✓ needed between sunset and sunrise and in periods of restricted visibility
- ✓ lantern or flashlight shining with a white light suffices for canoe/kayak

Activities: Safety and Dress

Sinkers and Floaters

Modified with permission from *Fish Iowa! A Teaching Module*, Iowa DNR

Overview:

Students practice putting on PFDs in a hypothetical capsize situation.

Associated Objectives:

- ❑ Students will become familiar with basic safety and dress guidelines for canoeing or kayaking.
- ❑ Students will become familiar with terminology and equipment associated with canoeing and kayaking.

Time:

15 – 30 minutes

Materials:

PFDs of different sizes, and in various conditions (some should be illegal with straps broken, material ripped, etc.), there should be two or four PFDs in good shape and the proper size

Directions:

Refer to "Required Equipment" in **Regulations and Ethics** section of the *Background Information* for more information about legal requirements for PFDs. Have two or four students volunteer to participate while the rest watch. Volunteers pretend to "paddle" two canoes. Have a pile of PFDs in each "canoe." At your signal, the "canoe" capsizes and the "paddlers" see how quickly they can correctly put on legal PFDs. Time how long it takes. Determine who has on legal PFDs and who would be struggling if they were in the water. Discuss the problems with the illegal PFDs and remove all illegal PFDs from the "canoes."

Repeat the activity a second time. This time the PFDs all are legal and should be untangled and properly adjusted. Since canoes capsize very quickly, "paddlers" should try to get them on in under five seconds. Determine if any "paddlers" would have their PFDs on before entering the water. Explain to students that canoes may capsize without warning. When the craft capsizes all its contents enter the water and may float away if they are not secured to the canoe. Paddlers may not be able to reach their PFD.

Have the canoe capsize a third time. Paddlers should have their PFDs on and properly adjusted. Students should decide which method is safest: having legal and illegal PFDs aboard, having legal PFDs on board, or wearing legal PFDs at all times.

Evaluation:

Students should be able to recognize whether a PFD is legal or illegal. Students should be able to demonstrate the proper way to wear a PFD. They also should recognize the best time to put on a PFD is before entering the craft.

Extensions:

Have students model different types of PFDs. Models should demonstrate how to read the label, select a proper size, and watch for wear or tear. (Modified with permission from *Fish Iowa! A Teaching Module*, Iowa DNR)

Students play a game similar to musical chairs. They walk around a pre-defined circle containing a pile of PFDs. At the start of the activity the number of PFDs are equal to the number of participants. While the music plays, students walk around the pile. When the music stops, the students scramble to get a life jacket and put it on. Check to make sure everyone is wearing her PFD correctly. Tell them that following the next round they will be "out" if they are not wearing their PFD correctly. Take one PFD from the pile after the first round so one participant is left without a PFD. Start the music and repeat the process.

Have one student wearing a PFD demonstrate the H.E.L.P position in water. (See "Other Safety Tips - Hypothermia" in the **Safety** section of the *Background Information* for a description of this position.) Have another student get into the H.E.L.P. position without a PFD. Time students to see how long they can stay afloat in the water. Pair students and let them choose whether or not to wear a PFD. Most should agree that in order to survive, one must wear a PFD.

Don't Catch that Cold!

Modified with permission from *Fish Iowa! A Teaching Module*, Iowa DNR

Overview:
Students notice differences in water temperature by placing their hands in water of different temperatures.

Associated Objectives:
- ❑ Students will become familiar with basic safety and dress guidelines for canoeing and kayaking.
- ❑ Students will become familiar with ways to prevent hypothermia.

Time:
20 – 45 minutes

Materials:
Large containers holding water of various temperatures (e.g., 80°, 70°, 60°, 50°), thermometer(s), towels

Directions:
Refer to "Other Safety Tips – Hypothermia" in the **Safety** section of the *Background Information* for more information about hypothermia. Have volunteers place their hands in each container of water, starting with the warmest and ending with the coolest. Allow time between containers for hands to warm up. Have students imagine their entire body in water that temperature.

Ask students:
Can you get hypothermia in water this temperature?

How long do you think you can stay in ___° water before hypothermia sets in?

Discuss how hypothermia can strike in any water temperature. (See the "Hypothermia Chart" in the *Background Information.*)

What are some symptoms of hypothermia?

Discuss/demonstrate how to assume the *huddle* and *H.E.L.P.* positions. Discuss other ways to prevent hypothermia as well as immediate treatment of hypothermia.

Evaluation:
Students should be able to successfully identify symptoms of hypothermia and ways to prevent it. Students should realize hypothermia can occur at any time of year in water at any temperature.

Extensions:
See if students can keep their hands in the waters of different temperatures for one or more minutes (watch for redness, numbness, and burning sensations in cooler temperatures).

What to Wear!

Overview:
Students decide what to wear paddling based on various conditions.

Associated Objectives:
- ❑ Students will become familiar with basic safety and dress guidelines for canoeing or kayaking.
- ❑ Students will become familiar with terminology and equipment associated with canoeing and kayaking.

Time:
20 - 45 minutes

Materials:
Different styles of clothing (socks, shorts, jeans, wet suits, cotton shirts, fleece jackets, sandals, boots, waders, etc.) made of various materials (cotton, rayon, fleece, etc.), slips of paper describing weather and water conditions (one for every group)

Directions:
Copy and cut the "Paddling Conditions" handout. Split students into small groups (2-3) and give one condition slip to each group. Tell students they are going paddling. Optional: Provide copies of "Dressing for Paddling" from the **Paddling Equipment** section of the *Background Information.* Have students select the most appropriate clothing for the situation. Each group should present their choices and explain them.

Ask students:
What would you wear on a warm, early spring day for a picnic? Should you wear the same outfit paddling? Why or why not?
Is water temperature the same as air temperature? Which should you dress for when paddling?
Why is it important to dress appropriately for paddling?

Evaluation:
Students will select clothing appropriate for paddling conditions and be able to justify them.

Extensions:
Have students select PFDs and equipment for the given weather conditions also. Include faulty and good equipment for students to choose from.

Have one student per group "model" the appropriate clothing and/or equipment.

Paddling Conditions

Weather conditions: sunny, breezy Air temperature: 80 ^{o}F Water temperature: 50 ^{o}F	Weather conditions: cloudy, breezy Air temperature: 60 ^{o}F Water temperature: 75 ^{o}F
Weather conditions: sunny, calm Air temperature: 75 ^{o}F Water temperature: 50 ^{o}F	Weather conditions: cloudy, calm Air temperature: 65 ^{o}F Water temperature: 50 ^{o}F
Weather conditions: sunny, calm Air temperature: 75 ^{o}F Water temperature: 75 ^{o}F	Weather conditions: cloudy, calm Air temperature: 70 ^{o}F Water temperature: 65 ^{o}F
Weather conditions: cloudy, breezy Air temperature: 55 ^{o}F Water temperature: 40 ^{o}F	Weather conditions: sunny, breezy Air temperature: 90 ^{o}F Water temperature: 80 ^{o}F
Weather conditions: sunny, calm Air temperature: 95 ^{o}F Water temperature: 85 ^{o}F	Weather conditions: sunny, calm Air temperature: 80 ^{o}F Water temperature: 50 ^{o}F
Weather conditions: cloudy, breezy Air temperature: 50 ^{o}F Water temperature: 40 ^{o}F	Weather conditions: sunny, breezy Air temperature: 95 ^{o}F Water temperature: 85 ^{o}F
Weather conditions: cloudy, calm Air temperature: 60 ^{o}F Water temperature: 45 ^{o}F	Weather conditions: sunny, breezy Air temperature: 60 ^{o}F Water temperature: 55 ^{o}F
Weather conditions: sunny, calm Air temperature: 65 ^{o}F Water temperature: 65 ^{o}F	Weather conditions: cloudy, breezy Air temperature: 65 ^{o}F Water temperature: 60 ^{o}F
Weather conditions: cloudy, calm Air temperature: 55 ^{o}F Water temperature: 40 ^{o}F	Weather conditions: sunny, calm Air temperature: 85 ^{o}F Water temperature: 70 ^{o}F
Weather conditions: cloudy, breezy Air temperature: 80 ^{o}F Water temperature: 80 ^{o}F	Weather conditions: sunny, breezy Air temperature: 75 ^{o}F Water temperature: 65 ^{o}F

Paddling Telephone (Float Plans)

Overview:
Students play a game of "telephone" in which each must remember portions of their float plan to stay in the game.

Associated Objectives:
- ❑ Students will become familiar with basic safety and dress guidelines for canoeing or kayaking.

Time:
10 – 20 minutes

Materials:
copies of "Float Plan" worksheet, pencil, solid surface to write on

Directions:
Refer to the **Float Plan** section of the *Background Information* for a list of things to consider when developing a float plan. Have students form a circle. Give each student a "Float Plan" worksheet. (Note: This plan can be modified for different age/experience levels.)

Designate one student to fill in responses as they play the game. Another student starts the game by saying, "I'm going paddling and I'm leaving from **location**." The next person must repeat what the person next to him said and add something new from the plan. (e.g. "I'm going paddling and I'm leaving from **location** at **time.**") This continues until one person cannot remember the float plan details already stated. That person is out of the game and the next person must try to complete the phrase.

After the game, discuss the importance of float plans and information to be included. Ask students to recite the float plan they created during the game. Most, if not all, will have problems remembering the entire plan. The one exception should be the student who wrote down all the responses.

Evaluation:
Students should be able to identify information to be included in a float plan. Students should realize the importance of completing a *written* float plan before paddling.

Extensions:
Have students name other possible items to include in a float plan.

Float Plan

Name of Persons on Board (and emergency contact information):

_____

_____

_____

_____

Schedule:

Date Leaving: _____

Departure Time: _____

Date of Return: _____

Arrival Time: _____

Destination(s):

_____

_____

_____

If not back by date of return notify the following:

DNR Conservation Officer: _____

Sheriff's Department: _____

Other: _____

Description of Craft:

Registration Number: _____

Length: _____

Make: _____

Color: _____

Other: _____

Vehicle:

Location (Parking): _____

Description: _____

_____

License Plate Number, State: _____

Activities: Canoe Basics

Grab that Paddle!

Overview:
Students identify various parts of paddles, canoes, and kayaks by grabbing the respective part as it is called out in a fast paced game.

Associated Objectives:
- ❑ Students will become familiar with terminology and equipment associated with canoeing and kayaking.

Time:
15 – 30 minutes

Materials:
Canoe or kayak, paddle

Directions:
Using examples of paddling equipment, name and describe parts of a canoe or kayak, and their respective paddles. Refer to the **Paddling Equipment** section of the *Background Information* for an overview of terms.

Have students form a circle around one piece of paddling equipment. Elect one student as "caller," and one as "grabber." The "caller" names a part of the craft or paddle.

After a part is called out, the "grabber" grabs the part and hangs on to it until the end of the game. The student to the right of the "caller" becomes the next "caller" and the original "caller" becomes the "grabber." Each "caller" must name a different part. "Grabbers" must hang onto parts until there is no one left in the circle. (Instructors will have to name a part for the last "grabber.")

Parts of a…

Paddle: grip, throat, shaft/loom, blade, tip

Canoe: keel, ribs, gunwale, thwarts, freeboard (Optional terms: amidship, bow, stern, starboard, port, forward, aft, trim)

Kayak: floatation bag, braces/support walls, foot peg (Optional terms: bow, stern, starboard, port, forward, aft, trim)

Evaluation:
Students should be able to successfully name the parts of a canoe or kayak and paddle.

Extensions:
Have students draw equipment and label parts.

Create flash cards with the term on one side and a drawing or description of the part on the other. Students may use these to quiz each other or play "Memory" or "Go Fish."

Basic Strokes

Overview:
Students practice basic paddling strokes.

Associated Objectives:
- ❑ Students will become familiar with basic strokes for canoeing or kayaking and demonstrate their ability to use them.

Time:
30 – 45 minutes

Materials:
Canoe or kayak paddles, canoes or kayaks, PFDs

Directions:
Line students up in rows spaced at least five feet apart. Demonstrate each stroke as described in "Basic Strokes" in the **Canoe Paddling** or **Kayak Paddling** section of the *Background Information*. Have students repeat your actions after you perform each stroke until they have mastered it. (Optional: If you have experienced paddlers in the group, pair them with novices, so they can help coach them.)

Have students correctly don their PFD's. (See the activity, "Sinkers and Floaters.") Then have them load their crafts (See the activity, "All Aboard!: Boarding and Launching the Craft.") Now they can practice the strokes on water. You may wish to demonstrate each stroke again so students can repeat your actions.

Evaluation:
Students should be able to correctly demonstrate basic strokes.

Extension:
Go paddling orienteering. Refer to the "Orienteering" activities in the *Introduction to Outdoor Skills* module. Set up a course on the water and do it in boats. Do the activities found in the *Paddling Exercises* at the end of this unit.

All Aboard!: Boarding/Launching the Craft

Overview:
Students practice boarding, launching, and landing the craft.

Associated Objectives:
- ❑ Students will demonstrate appropriate techniques for entering, launching, and exiting a canoe or kayak.

Time:
15 – 30 minutes

Materials:
Canoe or kayak paddles, canoes or kayaks, PFDs

Directions:
If crafts are on a trailer, demonstrate correct unloading procedures. If age/ability appropriate, have students help unload remaining crafts. Demonstrate how to correctly carry a canoe or kayak to shore or dock. Refer to the **Launching and Landing the Craft** section of the *Background Information*. Have students correctly carry their canoes or kayaks to shore or to a dock.

Demonstrate how to properly launch/land the craft. Point out common mistakes and possible consequences. Have student pairs launch their crafts one at a time, making sure they follow correct procedures. Have students practice landing their crafts following the reverse procedure for launching. (Optional: If you are pressed for time, you can have students complete practicing basic strokes in the water, then demonstrate landing the craft at the end of your session.)

Evaluation:
Students should demonstrate how to correctly launch and land a canoe and/or kayak.

Reading the River

Overview:
Students recognize river hazards and ways to overcome them by scouting a section of river and deciding the best course of action.

Associated Objectives:
- ❑ Students will practice river reading skills.

Time:
20 – 30 minutes

Materials:
A section of river/stream that may be walked on shore and has potential hazards, paper, pens/pencils, copies of "Potential River Hazards" and "River Paddling Hints" from the **River Reading Skills** section of the *Background Information*

Directions:
Have students work in pairs or small groups to look for potential hazards paddlers may encounter. Students should walk the shoreline of a local river or stream and write down anything that might cause problems while paddling. Students should brainstorm in pairs or small groups on how they would overcome the obstacle if they were paddling. Have students share their ideas. Discuss these, as well as other potential hazards students might encounter.

Evaluation:
Students should recognize potential river hazards and be able to overcome them.

Extensions:
Have students role play their course of action.

Activities: Paddling Exercises

Water Obstacles

Modified from *Kayak and Canoe Games, Laurie Guillion, Menasha Ridge Press*

Overview:
Students practice different paddling strokes to get through an obstacle course.

Associated Objectives:
- ❑ Students will become familiar with basic strokes for canoeing or kayaking and demonstrate their ability to use them.

Time:
30 – 45 minutes

Materials:
Canoe or kayak, paddles, PFDs, buoys or other "obstacles"

Directions:
Review paddling strokes discussed in "Basic Strokes" in the **Canoe Paddling** or **Kayak Paddling** section of the *Background Information*. Create an obstacle course on a pond or lake using natural features or buoys. Create rules for each obstacle (e.g. paddlers must circle buoy, paddlers must paddle forward between the dock and overhanging tree and backward to get out, etc.). Have students practice the course. Time paddlers to see how quickly they can get through. Provide assistance or feedback if paddlers need help.

Evaluation:
Students should be able to identify which strokes work best in different situations.

Extensions:
Have students paddle the course backward.

Have three people per canoe.

Have each craft carry an object on the front of the craft. If the object falls off, they must start over.

Vary the tasks during different runs of the course. For example, the first run may have paddlers circle a buoy, while the next may have paddlers paddle backwards around a buoy.

Have students mimic another paddler's style of paddling during a section of the course. This may allow discovery of new, effective paddling strokes.

Paddle the perimeter of a lake or pond viewing every dock, overhanging tree, etc. as an obstacle. As paddlers become more acquainted with strokes, they should try missing the obstacles with as small of margin as possible.

Scavenger Hunt

Modified from *Kayak and Canoe Games, Laurie Guillion, Menasha Ridge Press*

Overview:
Students practice paddling in a designated area while looking for objects on a list.

Associated Objectives:
- ❑ Students will become familiar with basic strokes for canoeing or kayaking and demonstrate their ability to use them.
- ❑ Students will be acquainted with ways humans interact with natural resources including individual responsibility toward natural resources.

Time:
30 – 45 minutes

Materials:
Canoe or kayak paddles, PFDs, copies of "Scavenger Hunt" worksheet or a different list of items, pencils or permanent markers, clipboards

Optional: plastic covering for list or laminated copies of lists

Directions:
This activity can be done on ponds or lakes with designated boundaries, or while traveling down a river. In pairs or individually, paddlers look for all objects on the list, marking them off as they go (Note: paper may become wet and difficult to write on; plastic coverings or lamination will prevent problems). If this activity is done on a lake or pond, establish a finish time.

Paddlers should not take anything from nature. Removing most plants or animals from public areas is against the law. It is best to leave items where they are and promote low impact activities. Review "Paddling Ethics" in the **Regulations and Ethics** section of the *Background Information*.

Evaluation:
Students should demonstrate different strokes and maneuvers to find items.

Extensions:
Create different themes for the hunts: e.g. nature, senses, colors

Scavenger Hunt

No two items can be the same. Good luck!

- ❑ Something brown _____
- ❑ A Leaf _____
- ❑ Something that used to be living _____
- ❑ Something that has never been living _____
- ❑ A black bird _____
- ❑ A brown bird _____
- ❑ A four legged animal _____
- ❑ A two legged animal _____
- ❑ A seed _____
- ❑ Evidence of a living animal _____
- ❑ Litter _____
- ❑ Something green _____
- ❑ Something the same color as your eyes _____
- ❑ Something shiny _____
- ❑ Something smooth _____
- ❑ Something that has an odor _____
- ❑ Something rough _____
- ❑ Something that has a voice _____
- ❑ Something that likes to get wet _____

Additional Resources:

Title: **Basic Essentials: Canoeing**
Format: Manual/Book
Date Developed: 1999
Description: Tips for choosing a canoe, carrying a canoe, basic strokes and terminology, and safety; includes photographs and illustrations and a glossary
Source: Boy Scouts of America (*www.scouting.org*)

Title: **Basic Essentials: Canoe Paddling**
Format: Manual/Book
Date Developed: 2000
Description: A guide to paddling - information about choosing/sizing a paddle, loading/launching a canoe, and basic strokes; includes illustrations
Source: Boy Scouts of America (*www.scouting.org*)

Title: **Camp Boating; Program and Curriculum Guidelines**
Format: Manual/Book
Date Developed: 1993
Description: Curriculum guidelines for canoeing/kayaking programs at camps; includes illustrations, reference materials, and a glossary
Source: American Camping Association (*www.acacamps.org*)

Title: **Canoeing**
Format: Manual/Book
Date Developed: 1989
Description: Information about canoeing history, safety, equipment, loading/launching, and basic paddling strokes; includes photographs and illustrations
Source: Boy Scouts of America (*www.scouting.org*)

Title: **Canoeing, Outdoor Pursuit Series**
Format: Manual/Book
Date Developed: 1994
Description: Overview of paddle basics, loading/launching, basic strokes, and safety; includes color illustrations and photos, canoe materials comparison chart, basic strokes copy sheets, reference materials, and glossary
Source: Human Kinetics Publishers (*www.humankinetics.com*)

Title: **Canoeing and Kayaking Instruction Manual**
Format: Manual/Book
Date Developed: 1987
Description: Outline for a flatwater canoe/kayak course; includes illustrations, parts of a canoe/kayak and paddle and basic strokes copy sheets
Source: American Canoe Association (*www.acanet.org*)

Title: **Canoeing and Kayaking for Persons with Physical Disabilities**
Format: Manual/Book
Date Developed: 1990
Description: Guidelines, suggestions, and adaptations for teaching people with physical disabilities how to go canoeing or kayaking; includes illustrations, reference materials, sources for adaptations, a glossary
Source: American Canoe Association (*www.acanet.org*)

Title: **Fieldbook**
Format: Manual/Book
Date Developed: 1984
Description: Information about types of canoes, loading/launching, basic strokes, and safety; includes photographs and illustrations
Source: Boy Scouts of America (*www.scouting.org*)

Title: **Introduction to Paddling; Canoeing Basics for Lakes and Rivers**
Format: Manual/Book
Date Developed: 1996
Description: Basic information about parts of a canoe and paddle, transporting/loading/launching, basic strokes, and safety; includes illustrations, a glossary
Source: American Canoe Association (www.acanet.org)

Title: **Iowa Canoe and Fishing Stream Access Guide**
Format: Manual/Book
Date Developed: 2002
Description: A guide to river trips in Iowa; includes maps and access points
Source: Iowa Department of Natural Resources (*www.iowadnr.com*)

Title: **Iowa Lake Fishing Guide**
Format: Manual/Book
Date Developed: 2004
Description: Information about Iowa lakes and the fish that are found in them
Source: Iowa Department of Natural Resources (*www.iowadnr.com*)

Title: **Kayak and Canoe Games**
Format: Manual/Book
Date Developed: 1996
Description: Activities that reinforce canoe basics and strokes; includes illustrations
Source: American Canoe Association (www.acanet.org)

Web Sites

boat-ed.com/ia/ - Boat Iowa: online Iowa Boating Safety course
paddling.about.com – paddling terminology, launching and loading tips, tips for paddling with kids
waterdata.usgs.gov/ia/nwis/current/?type=flow – current streamflow of Iowa rivers
www.acanet.org/- American Canoe Association – basic information about equipment and clothing, safety tips, buying a canoe/kayak, where to paddle
www.acanet.org/pdf/beginnersguide-spread.pdf - American Canoe Association's Beginner's Guide; information about choosing a craft, equipment, and basic paddling skills
www.americanwhitewater.org - American Whitewater Association; safety information including river hazards, universal river symbols, rules of the road, and guidelines for river rescues
www.canoekayak.com/ - Canoe & Kayak Magazine; basic information about buying a canoe/kayak or paddle and where to paddle
www.canoesportoutfitters.com - Canoe Sports Outfitters; information on where to paddle, water levels, and rentals
www.desmoinesriver.org - float trips with maps, access points, driving directions, and GPS coordinates
www.dnr.state.mn.us/young_naturalists/canoeing/index.html - Minnesota Department of Natural Resources; *Let's Go Canoeing* guide for kids along with a teacher's guide
www.iowadnr.com/education/iawtr.html - Iowa Department of Natural Resources; information about Iowa's aquatic resources
www.iowadnr.com/education/outdoor.html - Iowa Department of Natural Resources; *Introduction to Outdoor Skills in Iowa: A Teaching Module*
www.iowadnr.com/fish/fishing/2004LakeFishingGuide.pdf - Iowa Department of Natural Resources; *Iowa Lake Fishing Guide*
www.iowadnr.com/fish/news/exotics/exotics.html - Iowa Department of Natural Resources; information about aquatic nuisance species
www.iowadnr.com/law/files/boat2003.pdf - Iowa Department of Natural Resources; *Iowa Boating Regulations*
www.iowawhitewater.org - Iowa Whitewater Coalition; safety tips, free paddling clinics
www.kayakonline.com/index.html - Kayak Online; information on kayaks and paddles, and where to paddle
www.paddling.net/guidelines/ - basic information about canoes, kayaks, paddles, and safety
www.propaddle.com/ - Professional Paddlesports Association; information about types of kayaks and paddling basics
www.redcross.org/ - American Red Cross; water safety information including rescue techniques