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4-H Fishing Sports Leader's Guide

Intermediate Angler

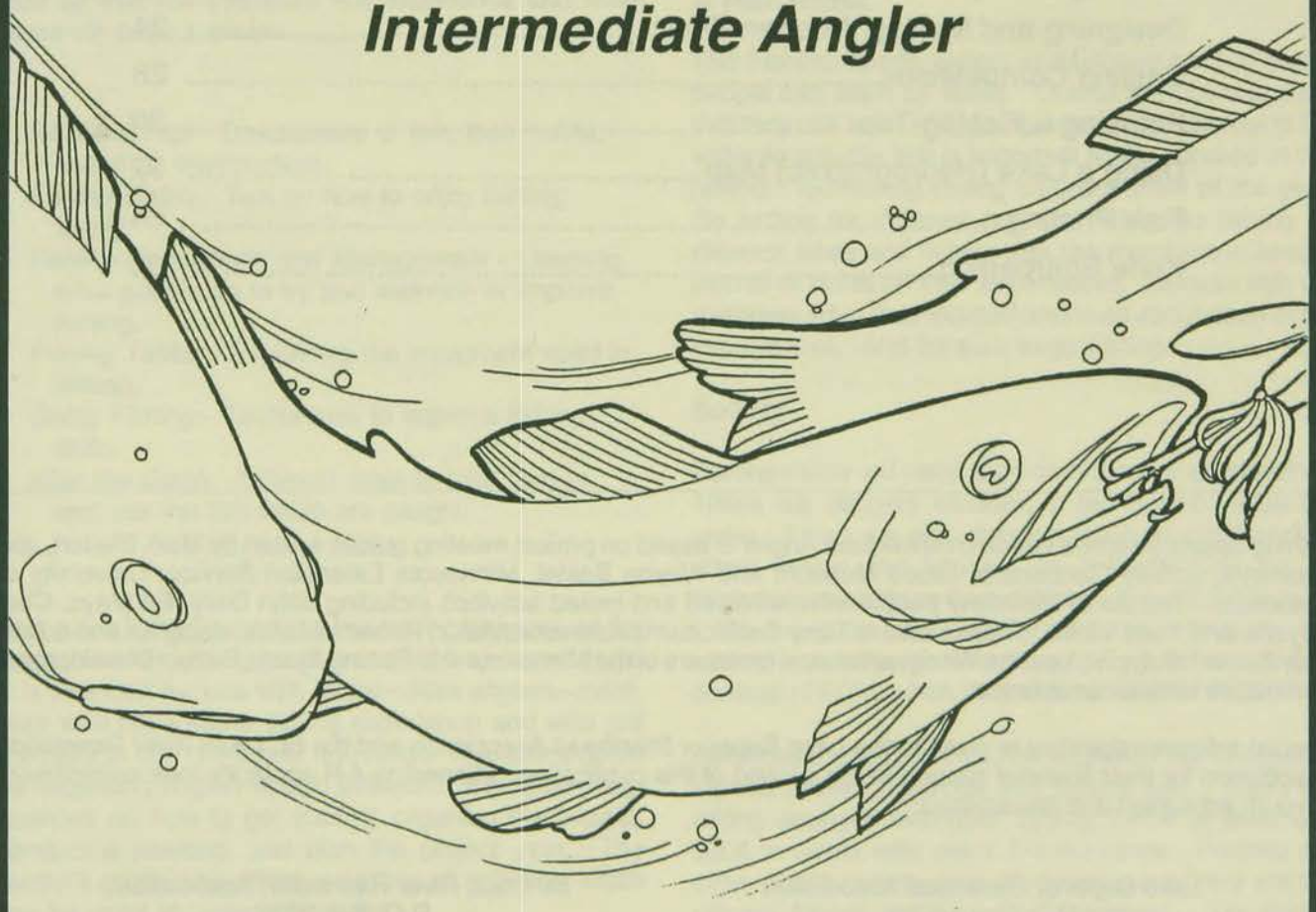

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TABLE OF CONTENTS

Fishing Sports Leader's Guide-Intermediate Angler is based on project meeting guides written by Mark Blauert, Joe Courneya, Jeffrey Gunderson, Bruce Munson, and Wayne Seidel, Minnesota Extension Service, University of Minnesota. Thanks to the many people who reviewed and tested activities including John Daily, Ed Mays, Chet Meyers, and Terry Wolfe. Thanks also to Terry Coble, curriculum coordinator; Roberta Maass, designer and editor; Judy Zomerfelt, typist; Leanne Witzig, artist; and members of the Minnesota 4-H Fishing Sports Project Development Committee for their assistance.

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Thank You

You play a very important role in introducing 4-H members to fishing. Everyone in the 4-H Program appreciates your time and efforts. We would like to offer you our thanks up front. Add our thanks to the satisfaction you will feel as you watch your Fishing Sports project members learn and grow.

Overview/Resources

To give the members a balanced experience in fishing, several publications have been developed. Each member should have a copy of the Fishing Sports project record. 4-H'ers are also encouraged to use the Fishing Sports advancement record. Both records are organized so that the members will experience and learn about six project areas:

All About Fish - Descriptions of fish, their habits, and their environment.
Fishing Safety - Tips on how to enjoy fishing safely.
Fishing Regulations and Management - Learning what people do to try and maintain or improve fishing.
Fishing Tackle - Explaining the equipment used in fishing.
Going Fishing - Techniques to improve fishing skills.
After the Catch - Different ways to take care of and use the fish which are caught.

This guide is the second in a series. It offers you, as the project leader, activity ideas for use at project meetings. It is intended for use with intermediate anglers--members who have some fishing experience and who are probably in the 11-13 year age range. A leader's guide for beginning anglers is also available. It includes suggestions on how to get started, organize the project, conduct a meeting, and plan the project year. The leader's guide also offers a variety of activities which can be used at project meetings.

As project leaders, you undoubtedly have fishing knowledge and ideas to share with project members. Sometimes it's hard to know how to share that knowledge with a whole group of youngsters. The leaders' guides are designed to offer the leaders some ideas. We know that young people in this age like to be active. They want to do something. The activities have been created to encourage the 4-H members to be actively involved in doing and learning. The activities are just a few ideas from all of the possible things that can be done.

Please feel free to change the activities or create and use your own. If you develop a popular and successful activity, share it with the state's 4-H Fishing Sports Project Developmental Committee. Perhaps we can then share your ideas with others.

A Reminder

The Fishing Sports project is designed so that young people can learn by doing. One of the obvious ways that they can learn is by going fishing. Getting out to the water to actually fish is important to the success of this project. Go fishing during different times of the year. Go fishing for different types of fish. Go fishing on different lakes and rivers. Ask the members to keep a journal or notes on their experiences. Discuss with the members what they learned and liked about each of the experiences. And be sure to go fishing.

Safety

Fishing safety will need to be continuously emphasized. There are dangers involved in being near or on the water. There are also dangers involved with handling sharp knives and hooks. As a leader you are an important example to the members. It is critical that you follow the same rules that you set for the members. For example, everyone should wear personal flotation devices (PFD's) when they are out on the water.

As a leader you also bear the responsibility of organizing the project meetings and fishing trips. If you are taking younger members fishing, have at least one adult to assist with every 3-4 members. Parents are often willing to help on such outings, but there are additional places to check for volunteers. Try asking members of local sporting organizations, civic groups, or even staff from agencies like the Department of Natural Resources to help. These same people may also be able to assist your project in other ways as it expands.

EXPLORING THE INSIDES OF A FISH

Importance of the topic

Fish are marvelously equipped for life in the water. Although most fishermen have caught, handled, and cleaned fish, many don't know or understand the anatomy of a fish. This activity was designed to help members learn to identify some parts of a fish. Members will also learn the function of some parts of the fish's anatomy.

What your 4-H'ers will do

Review the external parts of a fish.
Dissect a fish.
Learn some of the internal parts of a fish.
Understand the function of some of the fish's internal parts.

Preparing for the meeting

TIME: Allow 30-50 minutes. Time will vary with the size of the group and curiosity and neatness of individuals.

SETTING: This activity can be very messy. Be sure to work in an area where the tables or cutting surfaces can be easily cleaned off.

Supplies needed

Fish - Long fish, like suckers, carp, pike, or perch, are easier to work with than panfish. The members may want to use the fish they have caught themselves.
A fillet knife, a sharp pointed scissors, or scalpel. Members will need to be very careful when using these tools.
A fillet board or other cutting surface
Copies of the diagrams of the fish parts
Lemon juice

Involving the members

Review of External Anatomy

On page 9 of the Leader's Guide for Beginning Anglers, there is a puzzle activity to help learn the different parts of a fish. You may wish to review these parts before cutting the fish open to explore the internal anatomy. As you review the parts, also review their function.

Parts to review

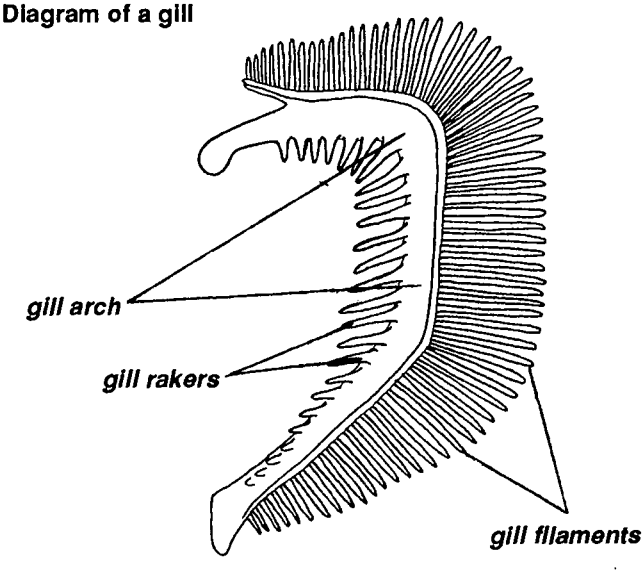
Fins - dorsal (anterior and posterior if two are present), caudal (tail), anal, pelvic (pair), and pectoral (pair). Note the hard and soft rays in the fins. Some fish, such as trout, have what is called an adipose fin on their backs.
Head - eyes, nostrils, mouth, cheek, and gill cover (operculum).
Body - lateral line, anus (vent), shape, scales, and coloration.

Internal Anatomy

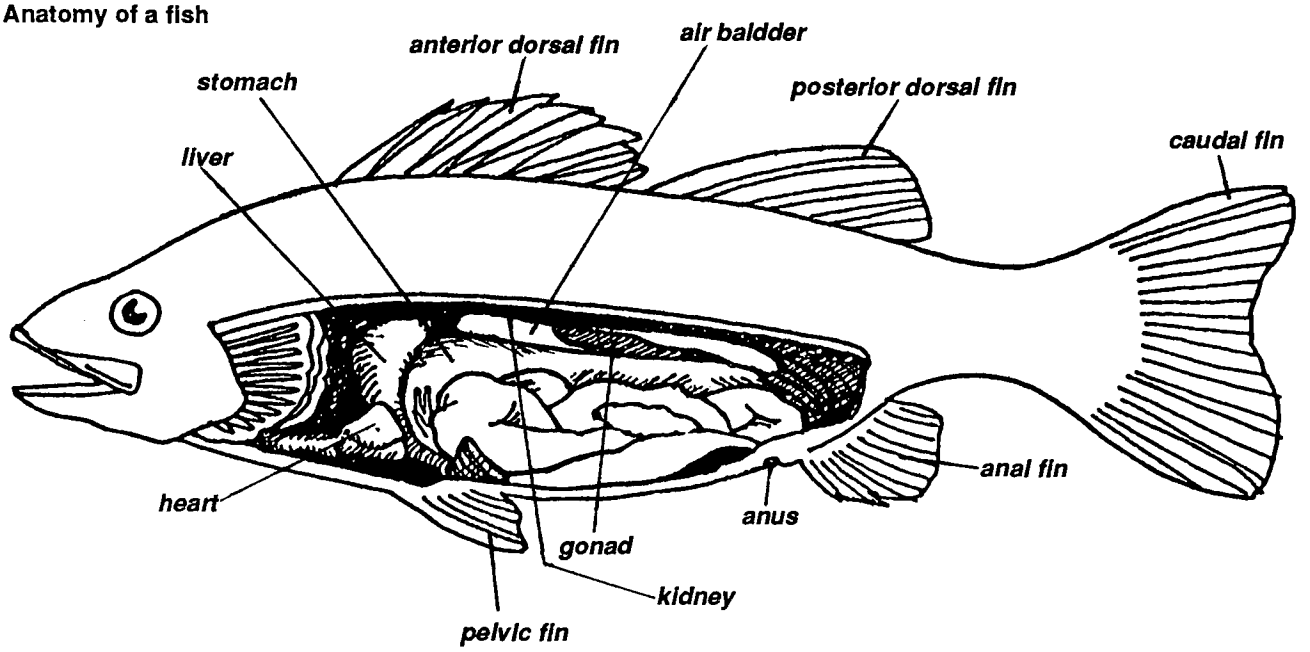
Before cutting open or filleting any fish, make sure the fish is dead. To kill a fish, use a hard object to strike it with a sharp blow right behind the top of the head.

Open the mouth of the fish and check to see if it has any teeth. If teeth are present, note how sharp they are. Look at the tongue. Notice how it is attached. Are there teeth on the tongue?

Diagram of a gill



Anatomy of a fish



Cut away the operculum (gill cover) and examine the gills. Count the number of gills present. Remove a gill and identify the arch, soft filaments, and hard rakers which strain debris and protect the filaments (see diagram).

Opening up Your Fish

Place the fish with its belly towards you. Start at the anus and cut forward along an imaginary line down the middle of the belly of the fish, which is called the midline. When cutting, be careful not to cut so deeply that the internal organs are damaged. Stop before you reach the gill area. Then cut up along the gill chamber towards the back of the fish. Stop at a point between one-half and two-thirds of the way up.

This is about the area that the backbone passes down the length of the fish and it may be visible. Make a similar vertical cut starting at the anus. Now lift up the flap of meat and skin and cut away to expose the body cavity and internal organs.

You should be able to see a lobed, reddish-brown organ towards the anterior (head-end) of the fish. This is the liver. Raise the lobes and look for the gall bladder. Remove the liver.

Find the stomach and examine the digestive tract. Follow the esophagus forward to the mouth. Notice the straight line from mouth to stomach. Cut open the stomach to see what the fish has been feeding on.

Now look at where the stomach and intestines meet. This junction is called the pylorus. Notice the finger-like projections coming out of this junction. The projections are called pyloric caeca ("stomach fingers"). These help with digestion. Follow the intestine back to the anus. There may be fat deposits along the loops of the intestine. Remove the digestive tract by cutting away at the anus and the mouth.

The pair of gonads (reproductive organs) will be located above the digestive tract and towards the rear of the body cavity. The male gonads (testes) will be smooth and cream color or white. The female gonads (ovaries) will be yellowish and have a granular appearance due to the presence of eggs. In mature fish, the size of the gonads will vary during the year. They will be largest right before spawning.

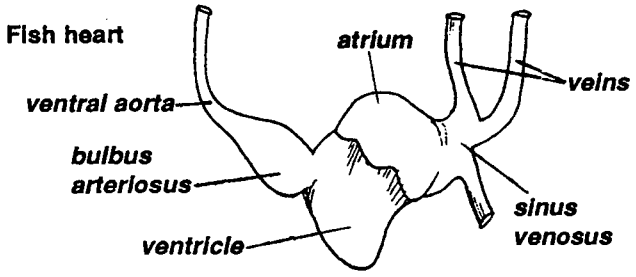
By this time you may have noticed a sac along the top of the body cavity. If you were very careful while opening up the fish, this air bladder may still be inflated like a small balloon. Most fish have air bladders. Of freshwater fishes, only a few bottom-dwelling species lack air bladders.

Along the top of the body cavity near the spinal column, you will notice a slender, dark mass which runs the length of the body cavity. These are the kidneys. The kidneys are used to remove waste products and excess water from the fish's blood. It is important to remove these if you are gutting and transporting a fish. Kidney tissues can spoil rapidly and give the surrounding meat a bad flavor.

Finally, find the heart. Look at the head-end of the fish under the gill cavity. You may have to cut further along the midline to expose this organ. This heart certainly does not look like a human heart. Fish have two chambers instead of four as in humans. The fish's heart functions by pumping blood to the gills and throughout the body.

Optional: The heart

Advanced members may wish to identify the various parts of the heart. Cardiac veins bring the blood to the sinus venosus which is on top of the heart. Next, blood flows into the single atrium which is above and behind the single ventricle. Blood exits from the bulbus arteriosus which helps pump blood through the ventral aorta. The aorta takes the blood into the gills. Draw and label the fish heart (see diagram below).



Optional: The brain

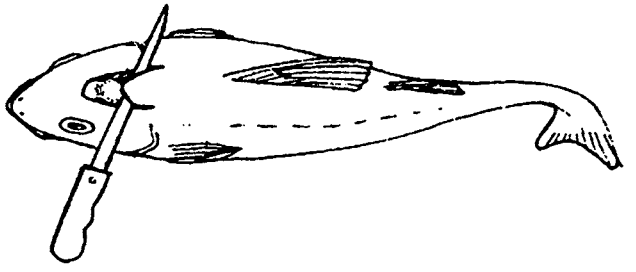
The brain is located between and behind the eyes. It is protected by hard cartilage and bone. Be very careful when exposing the brain. **DO NOT USE A FILLET KNIFE!** Use a scalpel or pocket knife to scrape and cut away layers of cartilage. A fillet knife is difficult to handle for this type of cutting, and can be dangerous.

When you cut away the cartilage, you will see the five lobes of the brain. The front lobe is the olfactory lobe. A thread-like nerve runs from it to the nostrils. The next lobe is the cerebrum. In more advanced animals it is used for conscious thought and decision-making. The cerebrum, or cerebral hemispheres, is poorly developed in fish when compared to more advanced mammals.

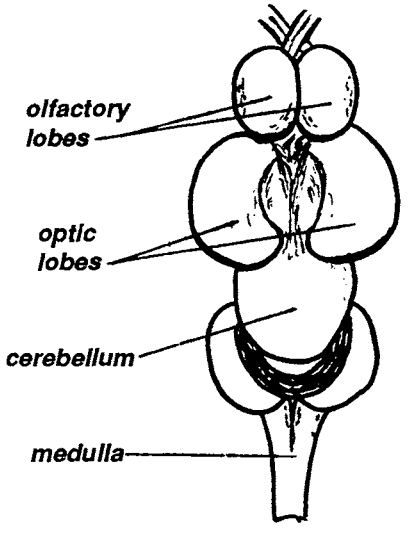
The third lobe is the optic lobe, the largest in most freshwater fish that are sight-feeders. You should be able to see a nerve which runs from this lobe to the eye. Behind the optic lobe is the cerebellum, used for coordination of movement and balance.

Finally, there is the medulla, which controls vital activities such as respiration. It connects to the spinal cord. Draw and label the parts of the brain (see diagram on next page).

Draw your diagrams here:



Exposing the brain



Fish brain (top view)

Summarizing the Activity

The 4-H'ers are now familiar with the parts and functions of a fish. They have a better understanding of how a fish survives in water, and can appreciate the uniqueness of fish.

Perhaps you wondered why you needed lemon juice. Lemon juice removes the fish smell from your hands. The acid in the juice breaks down the odor-producing molecules.

Questions to Ask

Q. Why are some spines hard?
A. Hard spines provide protection. Have you ever picked up a fish from the top and been poked? That's proof that it works.

Q. Some bass fishermen land their fish by grasping the fish by the lower jaw with their thumb inside the fish's mouth. Can all fish be landed this way?
A. No. Fish in the perch (i.e. perch, walleye, and sauger) and pike (i.e. northern and muskie) families have sharp teeth that will cut your hand.

Q. What purpose does the tongue serve?
A. The tongue is attached at the front and back of the mouth. People have tongues that attach only in the back of their mouths. A fish's tongue may help hold prey in its mouth.

Q. How does a fish get oxygen?
A. Fish breathe by taking in water through the mouth and expelling it over the gills. Oxygen is removed from the water by the gills similar to the way our lungs remove oxygen from the air.

Q. Why is it important for predator fish like bass, walleye, and northern to have a straight esophagus connecting the mouth and stomach?
A. A straight esophagus allows these fish to swallow large prey whole.

Q. What purpose does the air bladder serve?
A. The air bladder apparently helped primitive fish breathe. Now its major function probably is to help fish regulate the depth it will swim. Air is exchanged through the blood vessels. Air bladders may also help some fish to hear. Some fish make noises using their air bladders.

Q. Based on the size of the lobes, which sense appears to be best developed in most fish?
A. The optic lobes usually are the largest, telling us that sight is a well-developed sense in fish. However, experts will tell you that the sense of smell is the best-developed sense in some fish.

EXAMINING A FISH SCALE

Importance of the topic

Knowing the age of fish is essential for effective management. Techniques to determine fish age help fisheries managers decide how long a fish species lives, its rate of growth, its age at critical periods (for example, the first time it spawns), when its habitat requirements change, and when it begins migrating. Age information can also be used to evaluate special regulations and past conditions that affected growth rate.

Fish scales are commonly used to determine the age of a fish. They are usually easier to read and collect than other parts of a fish such as spines, ear bones, and vertebrae. These are also used to tell the age.

What your 4-H'ers will do

Collect scales from fish.
Examine a fish scale.
Determine the age of fish.

Preparing for the meeting

TIME: 45 minutes. One leader per 4-5 project members may be helpful.

Supplies needed

A few fish with large scales (crappie, bass, sunfish, carp)
an old toothbrush
food coloring
white paper
flashlight
pins
magnifying glass
reference scales
Optional: a microscope and microscope slides, a slide projector, and a screen

Involving the members

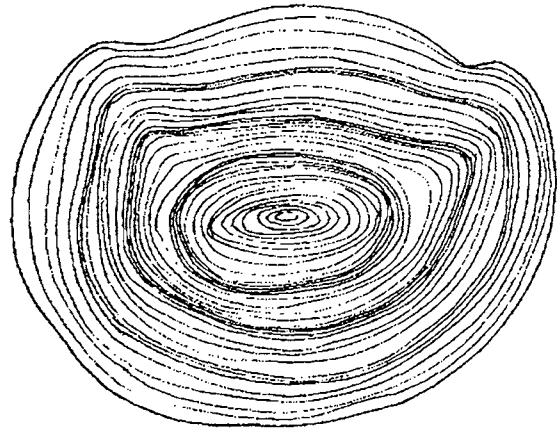
It requires training and practice to become accurate in determining the age of a fish from its scales. It will be helpful if 4-H'ers have a copy of reference scales and the fish length/age table to help them learn the age determination technique.

Place numbered reference scales copied from page 38 or acquired from a local Department of Natural Resources office, university, or college biology department, on a table. Let 4-H'ers examine the scales and write down their age guesses on a piece of paper. Compare each member's age estimates to the actual ages.

Discussion of correct way to estimate age from scales

To understand how the rings form on a scale and thereby determine the age of a fish, we must understand how fish grow. When a fish hatches from an egg it has no scales, but scales quickly form during the first few weeks of life. As soon as scales are formed, fine ridges or rings begin to appear on them as the fish grow. These rings, called circuli, do not indicate the age of the fish, but their spacing can indicate how fast the fish is growing.

Since fish grow rapidly during warm summer months and only slightly during winter, we can estimate the age of fish by looking for these periods of slow winter growth on their scales. Crowded circuli and circuli that cross over each other are produced by slow winter growth and constitute annual marks called annuli. These annuli tell a fish's age.



Scale from a fish in its 4th year

Ask 4-H'ers to remove a scale from a fish and examine it. Ask them to run the point of a pin along the length of both sides of a scale. Are there ridges (circuli) on both sides? Have 4-H'ers identify the focus and portion of the scale that is visible when attached to fish (note: only a small portion of the scale is visible when attached). Estimate the age of the fish by using the method described on the following page.

Scrape off a few "key" scales from a fish. Take "key" scales from spiny-rayed fish (sunfish, walleyes, bass) just below the lateral line and the middle of the spiny dorsal fin. Take "key" scales from soft-rayed fish (trout, northern pike, suckers) above the lateral line and from the front half of the fish. Brush the scales clean with an old toothbrush and water. Place a drop of food coloring or dye on each side of the scale, wipe off the excess, and allow the scale to dry. Place the scale on a white background and shine a beam of light onto the scale.

Look through a magnifying glass and count the number of dark bands which appear. The dye will appear dark where circuli are close together (at annuli) and will approximate the age of your fish. Scales can also be examined by placing them under a low-power microscope or by mounting them in a 35mm slide and viewing them with a slide projector and screen.

Questions to ask

Q. How could you verify whether or not you are aging fish accurately?
A. 1) Examine growth rings found on other hard body parts like ear bones, spine sections or vertebrae sections; 2) tag and release fish — upon recapture you should age them older by the number of years they have been released; 3) ask another professional to age the scales and see how your estimates compare or; 4) raise fish in captivity so you know their age.

Use the length/age table on page 39 to estimate the fish's age. Compare these results to your age estimate using the scales. Do the two techniques provide similar results?

Q. Can fish grow slow at times other than winter and create "false annuli" on scales?
A. Yes. This frequently occurs when fish stop feeding during spawning. These marks on scales are commonly called spawning checks.

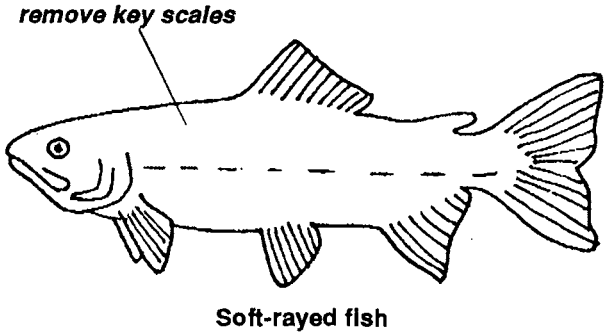
Q. Do fish in the tropics, where it doesn't get cold during the winter, have annular marks on their scales?
A. It is very difficult to age fish from warm climates or aquariums because conditions of food and temperature do not differ greatly throughout the course of a year. In some cases, marine tropical fish show annual marks, although there are no well-known seasonal changes in feeding or other conditions to account for such marks.

Q. What happens when a fish loses a scale?
A. New scales grow back. They can be identified by the lack of circuli in the center of the scale. These "regenerated" scales cannot be used to age fish.

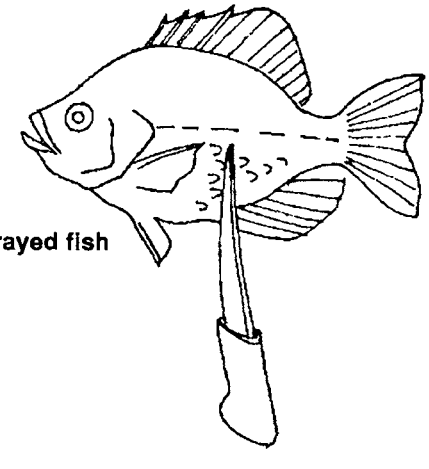
Q. Is the age of a fish collected in the spring represented by the number of annuli present on the scale?
A. Not necessarily. If growth has not yet begun and there is considerable distance from the last annuli to the edge of the scale, the fish is one year older than the number of annuli because the last annuli is not yet visible.

Q. What are some Minnesota fish that don't have scales?
A. Catfish, bullheads, madtoms, stonecats, sticklebacks, sculpins, lamprey.

Removing key scales



Soft-rayed fish



Spiny-rayed fish

SAFETY ON THE WATER

Importance of the topic

Capsizing (tipping over) a boat and drowning is a danger that concerns all people who fish. An average of about 100 people die in Minnesota each year from water accidents. Nearly half of all water-related deaths involve boats. Generally, most boating deaths occur when the boater is in a canoe or a small, open boat powered by an outboard motor of less than 40 horsepower. The three most common types of boating accidents that cause fatalities are capsizing, falling overboard, and swamping. All of these are potential dangers for people who fish from boats.

Using personal flotation devices (PFD's) and knowing how to properly use a boat are important to safe fishing.

What your 4-H'ers will do

Practice using different types of PFD's.
Practice putting on PFD's while in the water.
Learn how balance and center of gravity affect the stability of canoes.

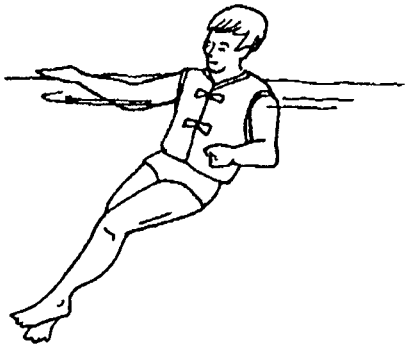
Preparing for the meeting

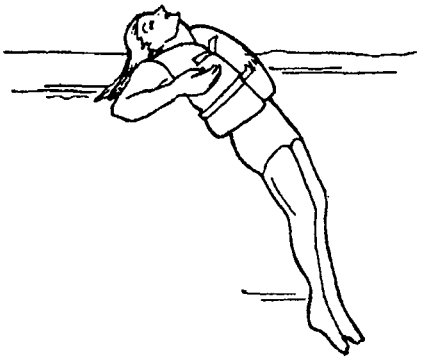
TIME: About 1 hour.

SETTING: This activity needs to be done in the swimming area of a lake or in a pool. A certified lifeguard must be present during the activity.

Supplies needed

At least one canoe.
Three or more different types of PFD's: vest type, buoyant cushion, ski belt, yoke style, PFD jacket,





etc. The PFD's need to be the right size to fit the members. PFD's may be borrowed from parents, an outdoor club, a boating organization, or a school. Members should wear clothes that can get wet, and bring a towel and a change of clothes.

Involving the members

Kids seem to enjoy getting wet, especially on hot days. This activity should be very popular. When the group gets to the beach or pool, have the lifeguard identify the rules for safe use of the area. Ask the members to pair up to do the activity.

Offer the PFD's to the group and have each member try to put a PFD on over the clothes that they will wear in the water. When everyone has put one on, the partners should inspect each other to determine if the PFD's were put on properly. After the inspections, the lifeguard, project leader, or resource person should demonstrate the right way to wear each type of PFD. Have the partners again inspect each other to see that the PFD's are on properly.

When everyone is ready, enter the water in pairs going out to water level that is **no more than chest deep** (deeper water can only be used if members have shown they are accomplished swimmers). Have the members in each pair take turns experimenting with their PFD's. They should try floating on their backs and their stomachs. They should try going underwater.

Each member should also take off the PFD and try putting it back on while floating or swimming in the water without touching the bottom. Let each pair try other types of PFD's. Ideally, every member should experience using each type of PFD.

If the lifeguard or leader is capable of demonstrating the technique, it would be valuable to show how clothing can be used to make a temporary PFD. The lifeguard could also demonstrate the use of minnow buckets, coolers, hip boots, and other items to provide flotation.

Before the members become tired, bring the canoe into the water. Let two older or experienced members enter the canoe while wearing their PFD's. Keep the canoe in water that is no more than chest deep. Ask another pair to stand by to offer assistance if needed.

When the pair in the canoe is comfortable, they should try some of the motions that fishermen go through while fishing: reaching to pass something to another, pretending to cast or set the hook, moving suddenly to see something, standing up to cast, reaching out to land a fish. They should keep experimenting until they fall out of the canoe or capsize it. If an experienced canoeist is available, he or she may want to demonstrate how to get into a canoe from the water.

Let others try using the canoe. Find the limits for leaning or moving suddenly in a canoe. Does it make a difference if the members are sitting on the bottom of the canoe, sitting on a seat, or standing? A small rowboat could also be used for comparison.

Exercise caution during this demonstration. Falling into or striking the canoe can be dangerous.

Questions to ask

Q. Which PFD's will keep you upright in the water?
A. Note the diagrams. Type I, II, and III devices will help keep you upright in the water. Only the Type I PFD's will turn you over if you are face down in the water.

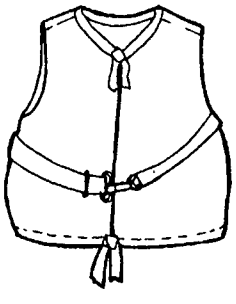
Q. Which PFD's are recognized as acceptable for boating safety?
A. All PFD's must have a Coast Guard approval number on the label to meet Minnesota requirements. The PFD must be the appropriate size for the intended wearer. The PFD's must also be readily accessible in case of emergency.

Q. Why should PFD's always be worn while in a boat?
A. Many PFD's are difficult to put on properly once you have fallen in the water. Cold water can slow you down and make it hard to use your hands.

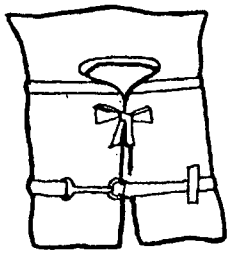
Q. Is it easy to capsize or swamp the canoe?
A. It can be fairly easy to fall out of a canoe, but capsizing or swamping it is not that easy. Canoes are less likely to tip if the center of gravity of objects in the canoe is close to the bottom. Keep objects low in the canoe. If the paddlers kneel instead of sitting on seats, their center of gravity will be lower and the canoe will be less likely to tip.

Q. If someone falls in the water and a PFD is not available, what can be used for flotation?
A. Many objects that are present when fishing can be used to help someone float: a partially-filled gas container, a sealed ice chest, a vacuum jug, oars, or even an emptied and closed tackle box.

Personal flotation devices (PFD's)

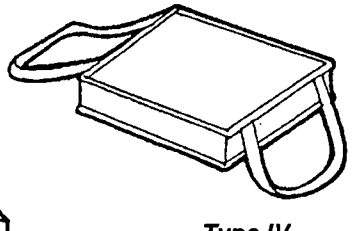


Type I



Type II

Type III



Type IV

FISHING ETHICS

Importance of the topic

Having a positive outdoor experience often depends on how we treat the out-of-doors and how other people treat us. The way we treat the environment and other people represents our "personal code of ethics". We often hear that a person with good ethics is called a "good sportsman" because they obey laws and treat the environment with respect. To protect our natural resources, we need to learn what is harmful and what is helpful to keep the out-of-doors healthy. Many laws now exist to make sure that people will keep the environment clean and healthy. It is our responsibility to obey these laws so that everyone can benefit from our wildlife, soil, water, forests, and other natural resources, now and in the future.

What your 4-H'ers will do

Learn about laws that protect natural resources.
Discuss proper conduct in general fishing-related situations.
Write their own "situation" to share with others.
Improve their skills in discussion, evaluation, problem-solving, small group work, decision-making, and writing.

Preparing for the meeting

TIME: 30-40 minutes

SETTING: Indoors or outdoors

Supplies needed

The project leader should make copies of the attached pages and cut out the "situation" cards. Provide blank index cards and pencils.

Involving the members

1. Divide the group into smaller groups of 2-3 members and give each group a stack of the "situation" cards.

2. Each member, in turn, draws a "situation" card. The member has two minutes to read it and decide what he or she would do in that situation.

3. The member then reads the situation out loud to the group and explains what action he or she would take, briefly describing the reasoning.

4. The other members in the group discuss the "situation" and state their view of what action should be taken, giving their reasons.

5. After discussion, the situation card is returned to the bottom of the stack and the next member selects a card. Continue this process until all the cards have been reviewed.

6. The group gathers together and the project leader reviews each of the "situation" cards. The project leader gives some background on each situation and explains any laws that may apply.

7. The group should return to their smaller groups to write up a "situation" card to share with the group (allow 5-7 minutes).

8. Each small group presents their situation to the other groups and allows them to discuss it. The reasoning and related laws are also discussed.

Summarizing the activity

Review the importance of good ethics and why laws are necessary.

Supporting activities

1. Invite the local Conservation Officer to meet with the project group to talk about both good and bad experiences involving laws and violators.

2. Write up a project report on the activity for the local newspaper about what the group has learned.

3. Have a project club "Quiz-a-rama" on Minnesota Fishing laws.

SITUATION CARDS

Situation 1. You are on a picnic near a lake with your family and you see another family leaving to go home. They have not picked up their trash. It is clear the other family is going to leave litter all around. Would you:

ask them to please pick up their trash before they leave
wait for them to leave and pick up the trash for them
take their license number and report them to a conservation officer
do nothing
other

Situation 2. You are fishing at a secluded lake and caught and kept four walleyes during your first day at the lake. On the second day, the fishing is so great you catch two walleyes in the first hour, both of which are bigger than yesterday's fish. Minnesota law allows you to possess 6 walleyes. Would you:

continue to fish and keep all the fish
dispose of the smaller fish you caught yesterday and keep any additional big ones to stay within your limit
have fish for lunch
fish for another kind of fish
quit fishing and go for a hike
keep fishing and let one of your fish go if you catch a bigger one
other

Situation 3. While visiting your friend, he shows you that his freezer is full of fish from the previous summer. He mentions that he caught his daily limit on many days and froze them all to eat during the winter. Would you:

ask if he could share some of his fish with you
mention that the law says he can possess only one legal limit of each type of fish
say nothing
ask for some helpful fishing tips
other

Situation 4. You and a friend are steelhead fishing along Lake Superior's North Shore. Neither of you have caught a fish the entire morning. Just before lunch your friend lands a six pound steelhead and discovers he "snagged" it (foul hooked). Would you:

tell your friend to release the fish
quickly put the fish in the ice chest
eat the fish for lunch
other

Situation 5. You are planning a fishing trip for your 4-H fishing club. One parent who volunteers to help does not have a fishing license and does not plan to purchase one before the trip. The parent is bringing fishing gear and apparently plans to fish. Would you:

tell the parent that it is illegal to fish without a license
say nothing and let the parent come along
ask the parent not to chaperone the trip if he/she does not purchase a license
ask the parent not to fish while on the trip
other

Situation 6. You have just heard about a secluded lake that has great fishing. The lake is located on private property with NO TRESPASSING signs posted along the property lines. You know of many people who fish there regularly without permission. Would you:

go ahead and fish
try and contact the property owner to ask permission
fish other lakes with public access
other

Situation 7. You are fishing with a friend and his brother at their cabin in northern Minnesota. While fishing, his brother puts in two lines saying, "it will increase your chances of catching fish." You and your friend each have one line in the water. Would you:

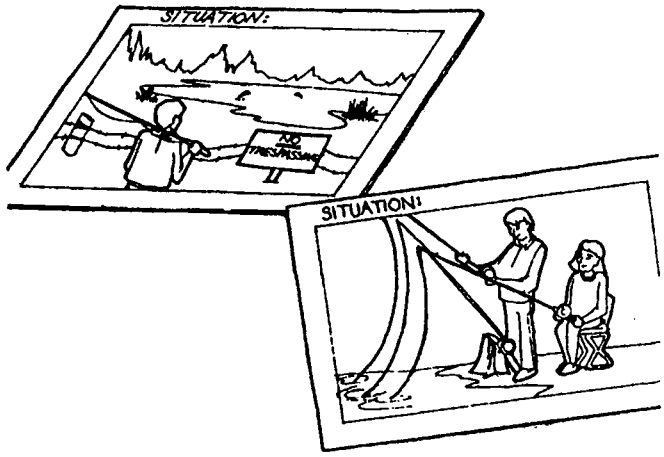
smile and wait for the first strike

tell him it is against the law to have more than one line per person

take out your line

ask him to take you back to shore

other



Listed below are the Minnesota laws for each situation:

Situation 1. It is against the law to deposit garbage or rubbish in public waters or on public lands.

Situation 2. In Minnesota, it is unlawful to possess more than one legal limit of each fish species. Stringer sorting is not catch and release and is also illegal.

Situation 3. It is unlawful to possess more than one legal limit of each fish species. Fish are in possession of an angler whether on hand, in cold storage, in transit or elsewhere.

Situation 4. Anglers must unhook and immediately return to the water any fish that is hooked (snagged) in any part of the body, except the mouth, in those portions of North Shore streams and rivers lying between Lake Superior and posted boundaries on the streams.

Situation 5. All residents who are at least 16 years old and under 65 years of age must have a license with them when they fish.

Situation 6. The Minnesota Trespass Law says that no person should enter any land not his own with the intent of taking wild animals after being notified not to do so, either orally by the owner, or by signs erected on the property.

Situation 7. Only one line may be used for angling, except that two lines may be used through the ice (other than designated trout lakes and streams). Two lines may be used on Lake Superior., and on some state boundary waters.

Fishing Ehtics was adapted from Project Wild, Western Regional Environmental Education Council, 1985.

LEARNING ABOUT FOOD CHAINS

Importance of the topic

Most 4-H'ers know that many fish survive by eating smaller fish and that the smaller fish eat still smaller organisms that live in the water. But some 4-H'ers do not realize that for a lake to be healthy, the fish and other organisms need to exist in balanced populations. In this activity, the members will learn that different animals living in lakes need to be present in different numbers in order to survive.

What your 4-H'ers will do

Identify a food chain that might be found in a lake.
Learn that the numbers of any type of fish that can be found in a lake will have a direct relationship to the numbers of fish that they feed on and that feed upon them.

Preparing for the meeting

TIME: Allow 30-45 minutes for this activity. At least ten members are needed to have this activity work well.

SETTING: A spacious area outdoors or indoors is needed to play the Food Chain game.

Supplies needed

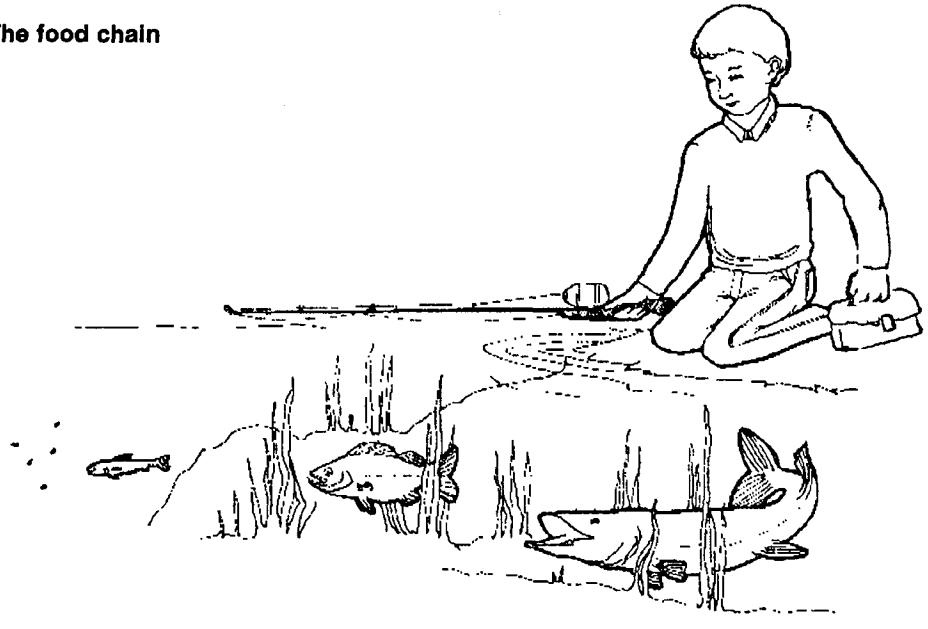
3-4 gallons of popped corn or a similar-sized object
sashes or headbands of three different colors (Sashes can be strips of cloth or pieces of macrame cord. Each color represents a type of fish. The members look at each other to see what type of fish each person is representing.)
"fish stomachs" - Use plastic sandwich bags to make the "stomachs". Place a strip of masking tape across the width of the bag, about 1 1/2 inches above the bottom of the bag.

Involving the members

Discuss food chains with the members. Can they think of an example of a food chain which includes a fish they like to catch? Point out that very small fish usually eat small organisms in lakes called plankton. Very small fish are then eaten by larger fish, which are eaten by still larger fish. Explain that the members will pretend to be fish to learn about food chains.

Begin by identifying boundaries of the "lake" where the game will be played. Spread "plankton" (popcorn) in the lake. Tell the members to act the parts of a food chain by pretending to be minnows, perch, and walleyes. (Other food chains can be used.) Members will use the appropriate color sash to identify the type of fish they represent.

The food chain



The object of the game is for some of each type of fish to survive a "day" (five minutes) in the lake. In order to survive the day, each fish has to get enough to eat and avoid being eaten. For minnows to survive, they have to collect enough "plankton" (popcorn) to fill their stomach-bags to the bottom of the tape. Perch feed by trying to tag a minnow with one hand. If they tag one, they empty the minnow's stomach into their bag. Minnows who have been tagged are dead and have to leave the lake. Perch must fill their bag to the top of the taped line. Walleyes are the top predators in this game. They tag perch and empty its stomach into their bag. Perch that have been eaten leave the lake. Walleyes also need to fill their bag to the top of the taped line.

Play the game several times. In the first game, start with equal numbers of each type of fish. After the first "day" (5 minutes) is over, or when the game ends because all of one type of fish have been caught, bring the group together and discuss the results. Have the members suggest what could be done so that the day would finish with at least one of each type of fish still alive. Try the different approaches.

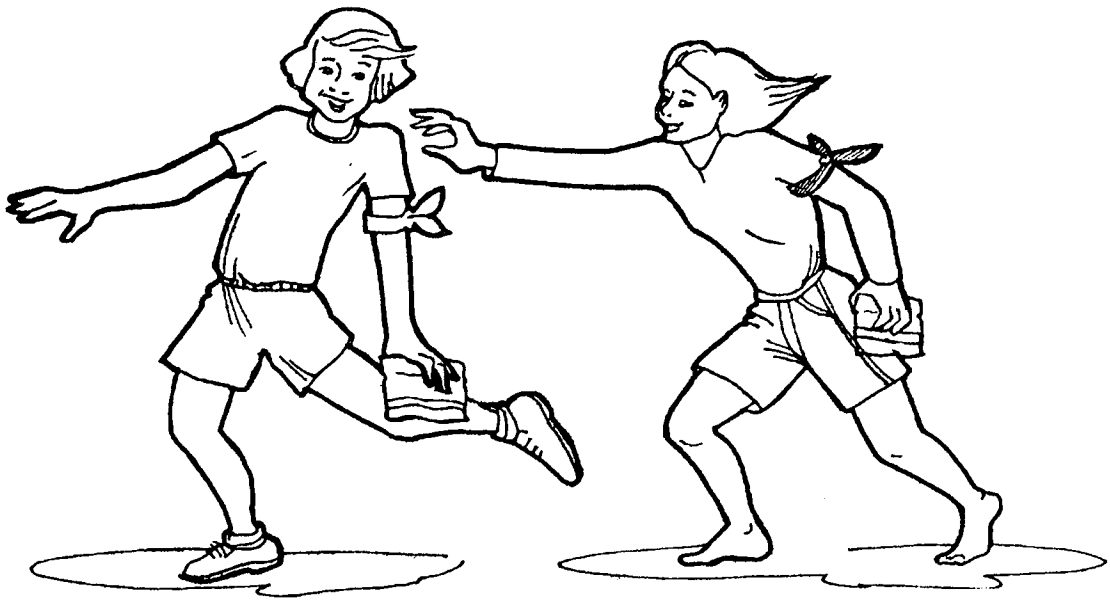
Questions to ask

Q. What balance of populations is needed for fish to survive in a lake?
A. As you progress up a typical food chain you will find fewer and fewer numbers of the fish higher on the chain; there will be more minnows in a lake than perch, and more perch than walleyes.

Q. What would happen if there was only half as much plankton in the lake?
A. Plankton forms the basis of food chains in water. If there is not enough plankton to keep all of the minnows alive, then the minnow population will decline. This could be followed by declines in the perch and walleye populations.

Q. What would happen if too many predators were added to a lake?
A. If too many predators are put in a lake, they may cause changes in the ecosystem that affect every level, down to the tiniest plankton. Potential impacts of overstocking include poor growth of predators, reduction of prey species, and changes in the plankton communities. Large numbers of predators can even influence water clarity. A reduction of prey species of fish could result in an increase in the tiny organisms that feed on algae. With less algae in the water, the water would become clearer.

Q. What are examples of food chains that can be found in lakes or streams?
A. Other food chains might include the following: perch - walleye - muskie; insect - bluegill - bass; minnow - crappie - northern.



Importance of the topic

Fish can be affected by many different types of pollutants. A problem for fish in some lakes and streams is acid rain. Acid rain, which is more accurately known as acid precipitation, can totally wipe out populations of fish in waters that are sensitive to that type of pollution.

Some lakes and streams in northeastern Minnesota are particularly susceptible to acid rain. The acid precipitation falls from the skies in the form of wet and dry material which has been put into the air by factories, power plants, and cars. In some areas of the world, lakes no longer have fish because of acid precipitation.

Acidity is measured by scientists on a pH (potential of hydrogen) scale of 0 to 14. pH values of 7 are considered neutral--neither acid nor base. A pH of less than 7 is considered acidic, while a value of more than 7 is considered basic, or alkaline.

Most lakes have pH values that range between 6.0 to 9.0. Some fish will even find the pH at either end of this range stressful. Fish vary in their tolerance to pH, but most freshwater gamefish thrive in waters ranging in pH from 6.5 to 7.7. Acid rain may cause some lakes to become so acidic that it affects the development of eggs or, in severe cases, can even harm adult fish.

What your 4-H'ers will do

Learn about the problem of acid rain.
Compare the acidity of different liquids.
Use a homemade test for acidity.

Preparing for the meeting

Prepare an acid-indicating solution for this activity. It is easy to do, but takes a little time and should be made before the meeting. To prepare the solution, add about 1 1/2 cups of finely-chopped red cabbage leaves to about 1 quart of water. Bring the mixture to a boil, then simmer for about 10 minutes, or until the water takes on a distinct dark-purple appearance. Remove the mixture from the stove and strain out the cabbage pieces, saving the purple water. Cool the purple water before using it. The solution can be stored for 2-3 days if kept in a sealed container at room temperature.

You will need to collect samples of different types of water to use during the activity. Use tap water, spring water, distilled water, rainwater, or water from different ponds, lakes, and streams. Other liquids such as lemon or orange juice, pop, coffee, ammonia, or bleach (handle with care--do not mix the bleach with ammonia) can also be used. Let the 4-H'ers suggest some liquids they would like to test.

Make sure that medicine droppers, spoons, or other measuring tools are available. Have cups or glasses ready to use for mixing. Small paper cups work well.

Involving the members

Discuss acid rain and see how many members are aware of its impact on fish. Describe how a simple acid-indicator solution has been made out of red cabbage leaves. Explain that members will test different liquids and water samples for acidity. Have the members split up into pairs. Each pair should test a number of liquids (set this number based on the time available).

Before doing the testing, start by predicting whether the liquid will be acidic or basic. In each pair, the 4-H'ers should take turns doing two very important tasks: doing the testing and writing notes about what was tried and observed.

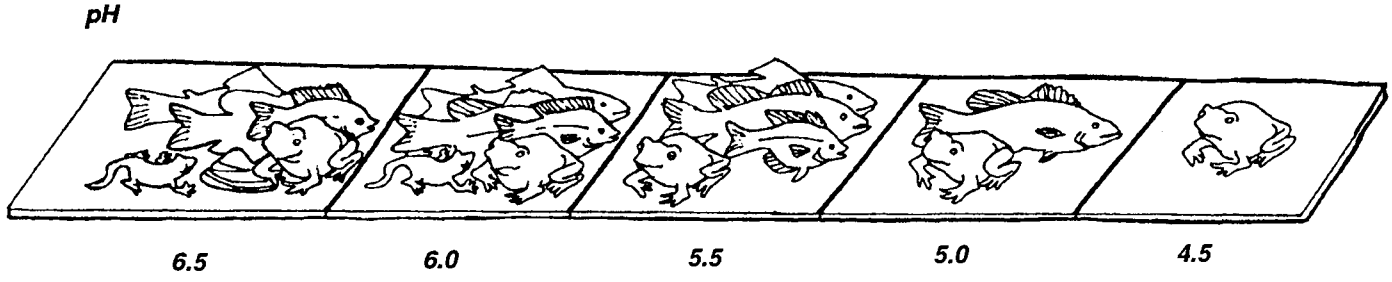
To test a liquid, put 2-4 tablespoons of cabbage (indicator) solution into a mixing cup. Then add a few drops of the liquid to be tested. The indicator will turn green if the liquid is a base. It will turn yellow if the liquid is a very strong base (water this basic would definitely kill fish). If the test liquid is acidic, the indicator will turn red. The indicator will turn light pink if the liquid is very acidic. If the indicator doesn't change colors, the liquid is very close to neutral.

After the 4-H'er pairs have done their tests, encourage them to find new things to test. Be sure to keep notes. When everyone is done testing, bring the group together and discuss what has been discovered.

Questions to ask

Q. Which solutions are acidic and which are basic?
A. Fruit juices, pop, coffee, and some water samples are acidic. Ammonia is strongly basic. Bleach is also basic. Mineral water, most tap water, and other water samples are likely to be close to neutral and will not change the color of the cabbage solution.

pH scale and its effects on aquatic animals



Q. Is acid rain a problem for fish?
A. Yes, it can be in certain lakes. If the lakes don't have a way of neutralizing the acid that falls on them, the insects and other animals important in the fish's food chain may die. The water may get so acidic that fish eggs won't hatch. Adult fish may die if the water is very acidic. Acidic water may also react with other materials. For example, it may change the chemical properties of mercury in the soil, rocks, or lake bottoms. The mercury can contaminate the fish.

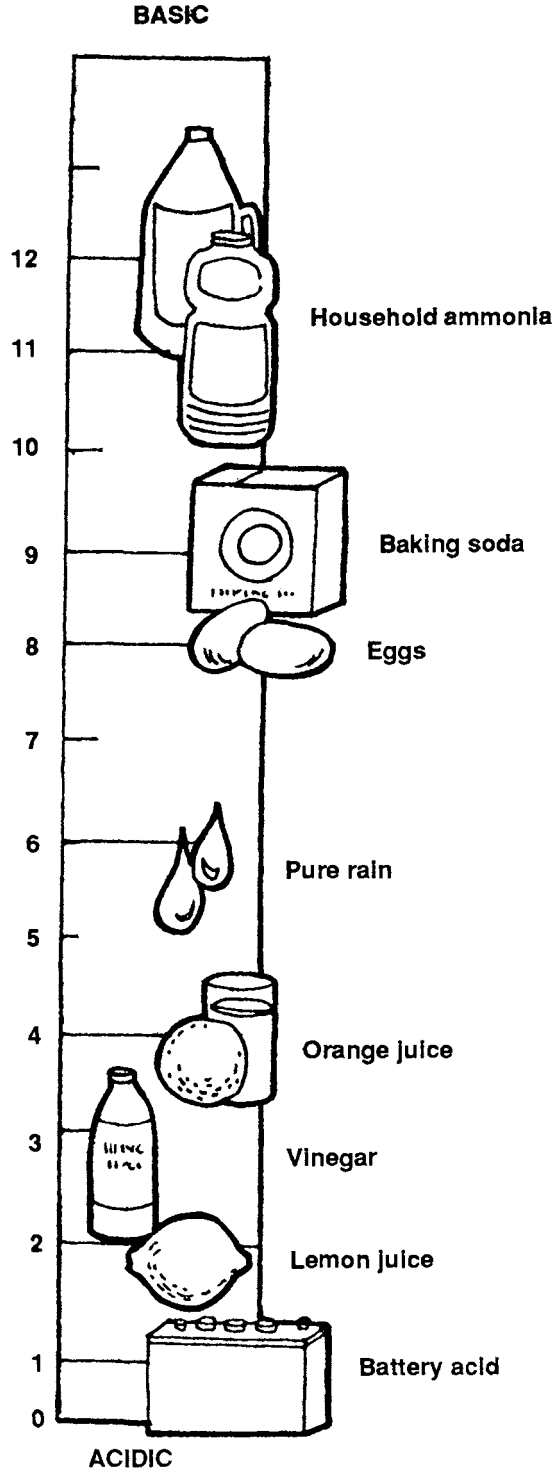
Q. Which lakes in Minnesota are most likely to be affected by acid rain?
A. Lakes and streams in northeastern Minnesota are normally most sensitive to acid rain. The soils and geology of northeastern Minnesota do not provide enough of the materials needed to buffer or neutralize the acid in the water. Generally, the lakes in the southern half of the state would not be affected.

Q. How does acidic water affect fish?
A. Each species of fish has a tolerance to different levels of acidity. If the pH level gets below a certain value, the fish can no longer survive. For example, if the waters reach pH of 5.5, the smallmouth bass disappear; at pH 5.2, walleye, burbot, and lake trout disappear; and at pH 4.7, northern pike, white sucker, pumpkinseed sunfish, and rock bass disappear.[1]

Q. What causes acid rain?
A. The major causes of acid rain are the emissions of sulfur dioxide and oxides of nitrogen from industrial or transportation sources. A chemical transformation in the atmosphere changes these pollutants into sulfate or nitrate particles, then into sulfuric acid or nitric acid. The particles or acids are carried by the air currents until they settle out as dry particles, or fall in the form of precipitation.

References

[1]Acid Rain in Minnesota, Minnesota Pollution Control Agency, 1984.



Acidity range

COMPARING FISHING RODS

Importance of the topic

Fishermen find that there are many different types of fishing rods on the market. No matter what kind of reel the member chooses to use--spin-cast, spinning, casting, or fly--there will be several options to consider when choosing a rod. The two most important features are the rod's "action" and "power."

Action refers to where the rod bends. Rods are typically classified as fast, moderate, or slow. Fast action rods tend to be good for jigging and setting the hook. They're also generally more sensitive than slow rods of the same material. Slow action rods are better shock absorbers when fighting a big fish.

Power refers to the strength of the rod--the amount of weight it takes to flex the rod. Most fishing rods are classified as ultra-light, light, medium, medium-heavy, or heavy.

What your 4-H'ers will do

Learn the difference between fast, moderate, and slow action fishing rods.
Compare the power of different fishing rods.

Preparing for the meeting

TIME: About 45 minutes.

SETTING: A large, open work area is needed.

Supplies needed

Members should be reminded to bring at least one fishing rod to the meeting. Provide at least one table where rods can be laid. Books or boards may be used to hold the rods high above the floor to do the tests. Weights should be prepared in advance.

Make at least two weights for each group of three. Make the weights by suspending a one-pound weight from about a twelve-inch string that has a snap or attachment at the other end (see diagram below).

Weights can be made from whatever is available: wood, lead, or a peanut butter jar with string. Use lighter weights as ultra-light rods are being tested.

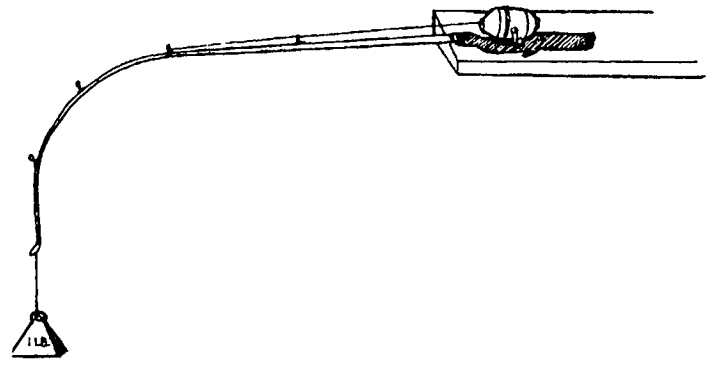
Involving the members

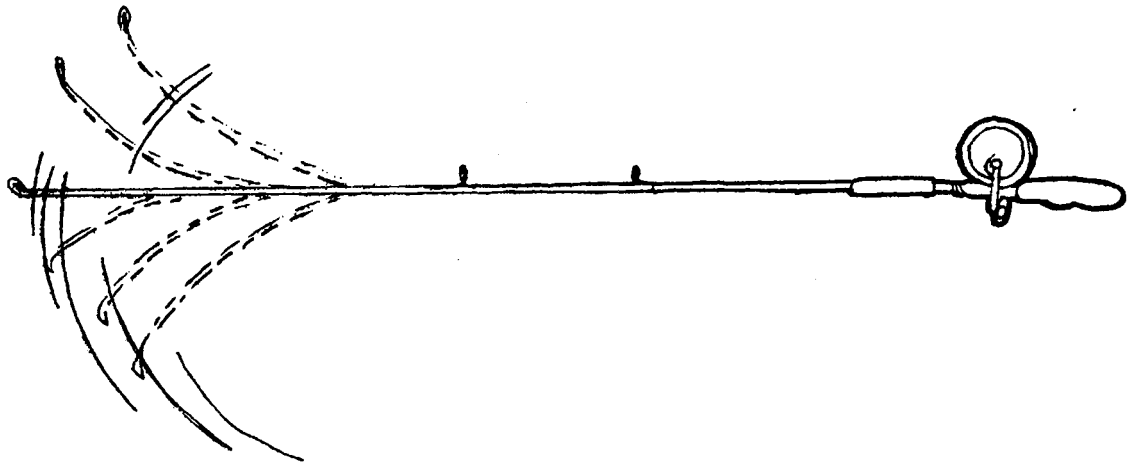
Divide the members into groups of three. Discuss rod action and power. Each group will compare the action and power of the rods that have been brought to the meeting.

Rods can be compared in pairs by hanging a weight from the tip of each rod and propping the rod up on the table as shown in the illustration. *Fast action rods* are those that bend most quickly at the tip. *Moderate action rods* start to bend near the middle. *Slow action rods* bend over the entire length of the rod.

Compare and classify the action of the different rods. Each group should take notes so that the results can be discussed later.

Testing rod action





Vibration

While observing the action, the members can also note the power of the rods. Heavy rods will be bent very little by the weight. Light rods will be bent quite a bit.

The power of the rod is very important in determining what size and type lures can be cast. It's very difficult to cast a large, heavy muskie lure with an ultra-light rod. It's also very difficult to cast an eighth- ounce jig with a heavy muskie rod. The choice of rods will depend on the type of fishing the fisherman wants to do.

After the weights have been taken off, the members can try one more test. Prop the rod up again and push the tip downward six inches. Release the tip. One of the members can use a watch to keep track of the time it takes for the tip to return to a still position. Do this with several rods.

How do the rods compare?

Questions to ask

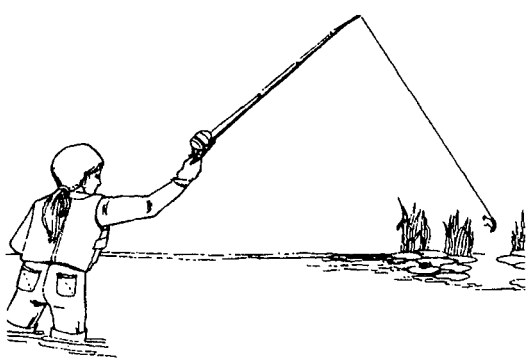
Q. When should one use a fast, moderate, or slow action fishing rod?
A. Fast action rods are likely to be more sensitive, good for jigging and working large poppers, and good for setting hooks. They would probably be the best choice for jigging for walleye or popping for bass.

Slow action rods tend to provide more shock-absorbing ability. This type of rod might work well when using a very light line. Slow action rods are also very popular with people who fish with downriggers. The deep bend that can be put in the rod will take up the slack line from the downrigger when a fish strikes.

Moderate action rods are all-purpose.

Q. How does the power of a fishing rod relate to the type of lure one may use?
A. Each rod is rated by the weight of lure it can easily cast. Ultra-light rods bend with very little weight and cannot be used to cast heavy lures. Heavy rods, on the other hand, are not flexed much by a light lure. Because of this, it would be difficult to cast the light lure very far with a heavy rod. The choice of rod will depend on the type of fishing done most frequently.

Q. What other aspects of fishing tackle affect casting?
A. Line weight will affect how well lures can be cast. The shape of the lure will affect how accurately or far it is cast. The type and condition of the fishing reel and amount of line on the reel will also affect casting.



REPAIRING FISHING RODS

Importance of the topic

Young anglers cannot always afford new fishing equipment. By learning how to repair or recondition broken or old fishing rods, the young angler can acquire a variety of fishing rods to match his/her angling needs.

What your 4-H'ers will do

Collect broken or old fishing rods.
Repair, modify or recondition the collected fishing rods.
Keep the repaired rods or sell them for a club fund-raising project.

Preparing for the meeting

TIME: This activity will require 2-3 meetings of 30-45 minutes each.

Meeting 1: Allow 15-30 minutes for discussion. No materials needed.
Meeting 2: Allow 45 minutes. Have broken rods, ferrule cement, epoxy glue, new or used rod guides, thread, fingernail polish, scissors, sharp knife, or razor blades.
Meeting 3: Optional fund-raiser. Sell repaired fishing rods.

Involving the members

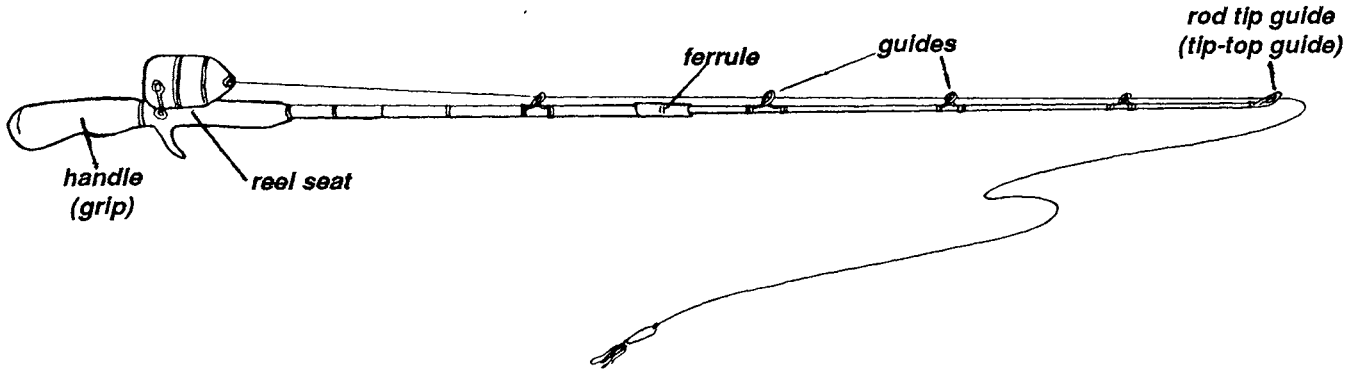
Meeting 1: This activity is designed to involve 4-H'ers in planning a strategy to locate and collect old, damaged, or broken fishing rods. The 4-H'ers may decide to do this as a group activity or to individually collect the rods which need repair. Lead a discussion which will help 4-H'ers come up with an effective program for collecting at least one rod per member.

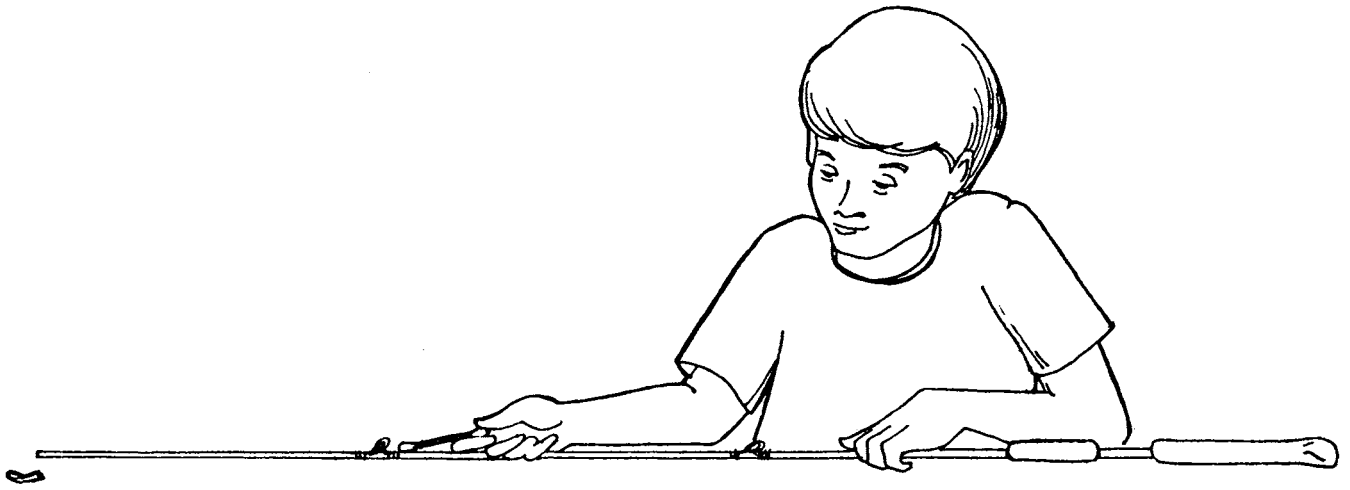
Members of local sport fishing groups are a good source of old equipment and may be willing to donate enough broken or unused rods for the activity. Door-to-door canvassing may also be used. Frequently, friends and relatives are able to provide the needed rods.

Meeting 2: 4-H'ers will repair the broken fishing rods at this meeting. It is recommended that local fishermen with experience in building and repairing rods be invited to lead the meeting. Begin the meeting by discussing safety when working with sharp tools, matches or other heat sources, glue, and the fishing rods.

Depending on the equipment collected you (or the members) may have to buy some rod guides prior to the meeting. In some cases, worn or old guides on a good rod can be replaced with good guides from a useless rod. Part of the fun of this activity is determining which rods should be repaired and which should be used for parts. Members may want to use broken stubs of rods to make ice-fishing rods.

Parts of a rod





The amount of effort to repair each rod and the quality of the final product will depend on the skill level of the members and of the leader. Rods with broken tips can be repaired by gluing on a new end guide, or all the guides can be removed and repositioned for a more professional look. New guides can be wrapped with thread and sealed with fingernail polish. High-quality wrapping patterns may be used to give a commercial look to the finished product.

For a learn-by-doing activity, you may want to let 4-H'ers glue and wrap guides on a rod as well as they can with no instruction. After they have made their first attempt, a knowledgeable rod builder can demonstrate a more professional approach. Good how-to books for building a fishing rod can be found in most public libraries and can be used in place of a local expert.

This activity will show members how to make some basic repairs on fishing rods. The skills may be used one day to salvage a fishing trip which would otherwise be ruined by the snap of a rod in a car door. Members will also have a functional fishing rod that they previously did not have. This activity may encourage some of the members to build their own "custom" rod from scratch.

Meeting 3: If this project was successful and members have repaired, modified, or reconditioned a large number of rods, you may want to consider a fund-raising sale or raffle. The fund-raising event will take at least one 30- to 40-minute meeting to plan. Guide members as they plan the event.

Questions to ask

Q. How can you tell if a rod guide is usable or not?
A. Many times a guide will get a nick or burr that will weaken and fray line that passes through it. Check for bad guides by wiping a cotton swab around the inside of the guide. Any nicks in the guide will catch the cotton. Replace any bad guides.

Q. How can you separate the sections of a rod if the ferrules are stuck together?
A. Hold the rod behind your knees with one hand on each side of the ferrule. Force the rod apart by spreading your knees and pushing them against your wrists. Twist ends of the rod in opposing directions. Be careful not to push against the guides or you may ruin them.

Q. What are some methods of temporarily repairing a rod?
A. Tape, especially electrician's tape, can be used to attach a rod guide. Tape can also be used to attach a reel to the rod if the reel seat has broken.

Q. How can you remove a ferrule or end guide from a rod?
A. Light a match or hold a source of heat under the ferrule or end guide. The glue will loosen and you can separate them from the rod. You can also reattach a ferrule or end guide by heating them with a match and then inserting the end of the rod. The glue will cool and harden, providing a solid connection.

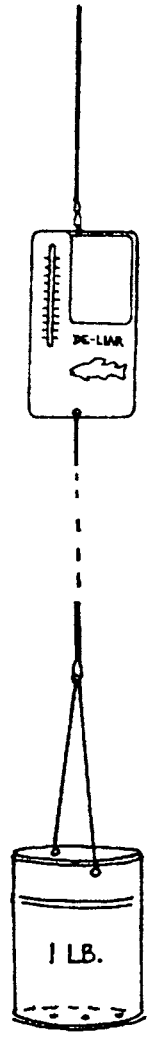
BUILDING A SIMPLE TROLLING SPEED INDICATOR

Importance of the topic

Trolling for fish is a popular method of fishing on many lakes and rivers. One important factor to considered for fishing success while trolling is speed. If a lure is trolled too fast or too slow, fishermen may go past individual fish or schools of fish without even enticing a strike. An important variable in trolling speed is the presence of wind while trolling. To maintain a desired trolling speed, an individual must set the motor speed differently when switching from trolling into the wind than trolling with the wind.

A simple, inexpensive device that can be made at home is a trolling speed indicator. This activity is designed to give youth the opportunity to learn about the importance of proper trolling speed. It will also give them an opportunity to build and experiment with a simple trolling speed indicator.

Trolling speed indicator



What your 4-H'ers will do

Learn why trolling speed is important for successful fishing.
Make their own trolling speed indicator to experiment with on their fishing adventures.

Preparing for the meeting

TIME: 30-60 minutes

The leader should do advance reading on such topics as trolling for fish, the effect of trolling speed on different fishing lures, and the habits of different fish species in a given area.

Supplies needed

fish-weighing scale (like the Fish De-Liar) or other scale
1-lb. coffee can (with cover)
2 snell leaders (30# test)
25 feet monel or braided wire
two large size snap swivels

For the entire group, provide hammers, nails or a punch for puncturing the can, and wooden blocks to use when puncturing the can.

Involving the members

The first step is to make sure there are at least five or six evenly-spaced marks on the fish scale. Next, bend the hook on the scale so that it closes completely, or that the wire can be attached without slipping off.

The second step is to punch a hole just beneath the rim on either side of the 1-pound coffee can. This is where the two snell leaders will be attached. Members may need to brace blocks of wood in the can before punching through it so that the can won't bend from the pressure.

The third step is to attach the two remaining snap swivels to the 25 feet of monel or braided wire. If braided wire is used, use copper or stainless steel so it won't rust or corrode in water.

Test the new trolling speed indicators. Does the can offer a reasonable amount of resistance at trolling speeds? If less resistance is needed, punch holes in the bottom of the can to allow some water to flow through.

It's advisable to hook the scale to the back of the boat before using the trolling speed indicator. Do not use the indicator when the boat is moving faster than trolling speeds. It may be dangerous.

Summarizing the activity

Although the trolling speed indicator seems too simple to be true, it is practical and works quite well. If the coffee can cover is saved, the members will have a tangle-free, mess-free means of storing their indicator for future use. Be sure to use heavy leaders, swivels, and wire line so that the indicator doesn't break during use. Good luck and have fun!

Supporting activities

1) Challenge the older members or parent-member teams to use their trolling speed indicators and keep good records of their observations. Give a project talk at a fishing sports project meeting, 4-H meeting, or a demonstration at the County Fair or other event.

2) Have 4-H'ers experiment with how trolling speed affects the action of different lures and have them determine which speed is generally better for certain lures.

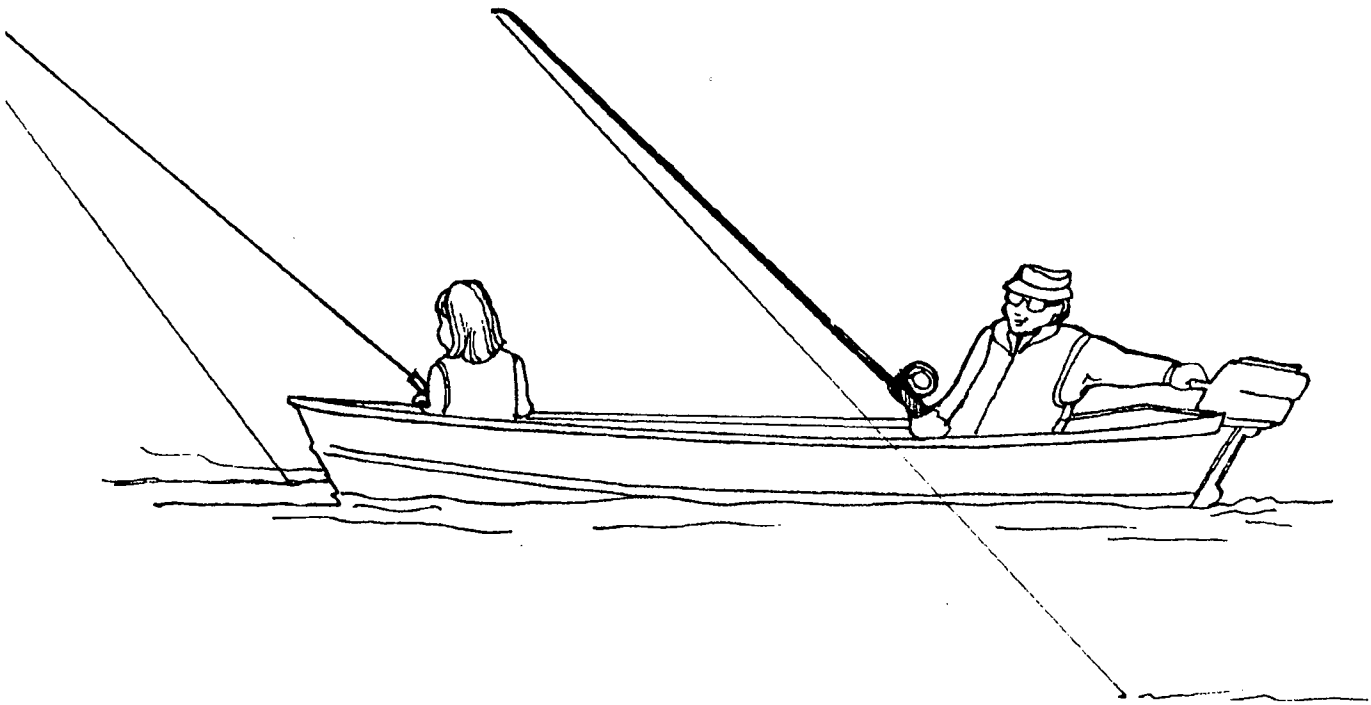
3) Have the members experiment with trolling speeds going upstream and downstream in a river.

4) Have members use their trolling speed indicators at several spots along the banks of a river to locate areas which have varying current velocities.

References

Oberrecht, Ken. *The Practical Anglers Guide to Successful Fishing.* 1978.

Wilson, Loring D. *The Handy Sportsman.* 1976.



DESIGNING AND MAKING WOODEN PLUGS

Importance of the topic

The art of wooden plug manufacturing is a dying one. The majority of the plugs made for today's fishermen are compressed plastic. While the new plugs are of excellent quality, they somehow don't compare to the solid wooden plugs of old. This activity was developed to give members the opportunity to explore the art of wooden plug-making.

What your 4-H'ers will do

Learn about the history of wooden plug-making.
Create a wooden plug for fishing or for show.
Develop skills in wooden plug-making. Using this knowledge, the members can experiment with ideas for future designs; and compare the difference between a plastic plug and a similar, homemade wooden plug.

Preparing for the meeting

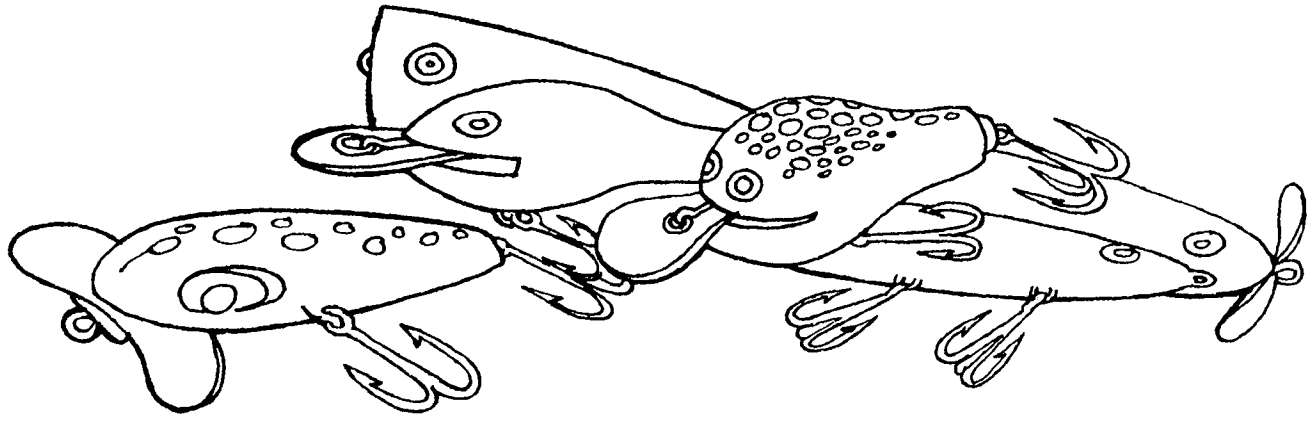
TIME: The project meeting should be planned for two sessions. In the first meeting, the group will whittle and shape their plugs. During the second meeting, they will paint the plugs and attach the hardware.

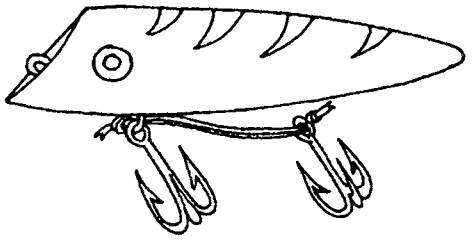
Alternatives include having each youth take their whittled plug home to have a parent help them paint it and apply the hardware. Or have the members return with their painted plugs for a second meeting to apply the hardware and test the action of each plug.

Supplies needed

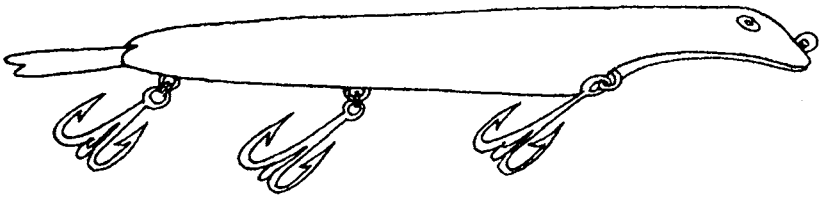
wood blanks - cedar is the preferred wood to use, but clear pine, fir or balsa will also work. Cut the plug blanks before the meeting.
band saw
coping saw
paint (epoxy enamel or any exterior grade)
hardware (screw eyes, wiggle plates, treble hooks, hook hanger)

An assortment of plugs





Trolling plug



Jerkbait

steel wool
sandpaper (120-, 240-, or 400-grit recommended) or rasp
paint brushes

This activity may require the help of additional leaders. It is suggested that there be one leader for each 3-4 members involved in this activity.

Involving the members

The project leader should make a few plugs to show the group. Showing examples will make leading the group easier. While the group is working on their projects, discuss the history of wooden plugs, types of wooden plugs, use of wooden plugs, and why wooden plugs have been largely replaced by plastic plugs.

Review the safe operation of all tools the 4-H'ers will use. Each individual may want to trace their own design on their blank plug. Then the plugs can be cut with a band saw or coping saw. The leader may want to do the shaping with the saw if the members aren't skilled with the equipment. The blanks are now ready for whittling.

After the plug has been whittled down and is proportional and well-rounded, it is ready for the final step. The plug should be sanded smooth with a rasp or sandpaper and then soaked in warm water for approximately one hour to raise the grain. Allow the plug to dry overnight before smoothing it with steel wool.

The plugs are now ready for the finish to be applied. An epoxy enamel-type paint will provide the hardest coat for the new plug, but an exterior grade of paint will also work. Paint may be applied by spraying, dipping, or with a small paintbrush. You may want to experiment to see what will work best with the group.

The last step in wooden plug-making is adding the hardware. It is best to use hardware that is made for lure-making. These are made of nickel, stainless steel, or chrome-plated brass and will not rust like ordinary soft iron/steel materials. It will also be easier to proportion hardware to lure body size if the proper hardware is purchased. Hardware may be purchased through mail-order catalogs or some bait and tackle shops.

After the hardware has been attached, the members may want to test each plug in a large aquarium or bathtub. This way, modifications can be made if the plugs don't float or swim right. Sometimes hardware may have to be removed and reattached to get the desired effect. Holes can be filled with wood putty and painted over.

Once the plug is carved, painted, and installed with hardware, the group can try the finished lures on their next fishing trip.

Supporting activities

1) Have the members fish with a friend, one of them using their homemade wooden plug and the other using a similar plastic plug. Record any difference in catch results.

2) Hold an afternoon fishing derby where each individual is allowed to use only their homemade wooden plugs. See who has the best luck.

3) Have the members read and learn about the effects of colored lures when fishing under different weather and environmental conditions.

4) Take a field trip to a tackle shop and compare the price of store-bought plugs to the plugs they made.

5) Set up a tank of water and let each member try their plug to see what kind of action their plugs have. Discuss why some move differently than others in the water.

6) Design a painting booth out of a cardboard box for spray-painting wooden plugs. This will eliminate paint overspray from spray-painting lures.

Questions to ask

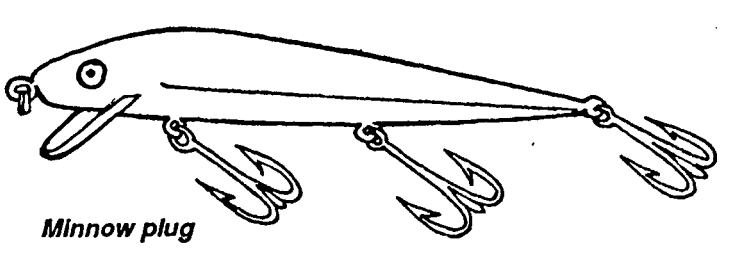
Q. How do plastic plugs and wooden plugs compare?
A. Comparisons can be difficult because there are many types of plastic and kinds of wood that are used for plugs.

Generally, plastic plugs are cheaper than similar wooden plugs. Plastic plugs of the same type will be more similar in action than wooden plugs of the same type. Wooden plugs are more likely to vary in their shape, weight, and action. Wooden plugs are also more likely to have their finish ruined through fishing. Just look at what a muskie can do to a wooden jerkbait.

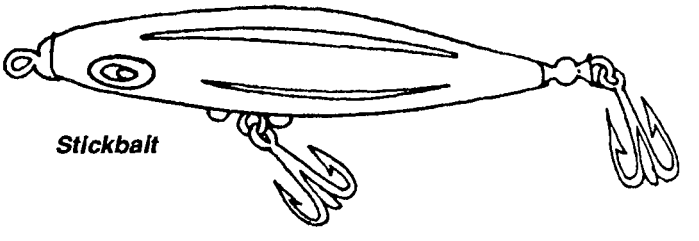
On the positive side for wooden plugs, they will sometimes have a better action than similar plastic plugs.

Q. How can a scale-like finish be painted on a plug?
A. First, paint the plug with a base coat of one color. Then place fiberglass screening or drywall tape over the plug. Spray the plug with a paint of a different color. Then remove the screening or tape. The finished product will have a scale-like finish.

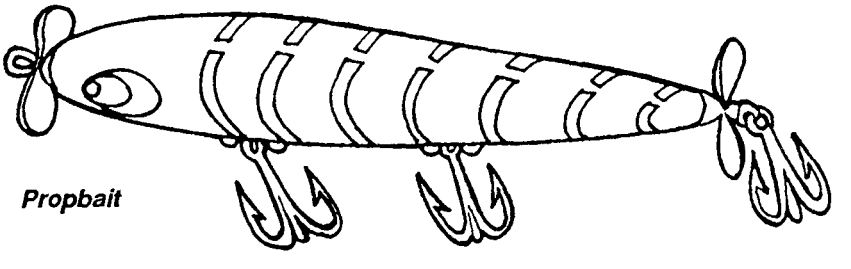
Q. How can you adjust the buoyancy of a wooden plug?
A. Weight can be added to a plug to give it a nose down, tail down, or neutrally buoyant flotation. Often the weight will be added by drilling the plug and gluing in sinkers.



Minnow plug



Stickbait



Propbait

The lure-maker can determine where to add the weights by taping sinkers to the plug or suspending sinkers from a line around the plug.

Try the plug in a tub of water. Add, subtract, and move the sinkers until the desired effect is found.

Q. What are some common types of plugs?
A. There are many different models of plugs. Some of the major categories are stickbaits, propbaits, chuggers, crawlers, vibrating plugs, crankbaits, minnow plugs, trolling plugs, and jerkbaits. There are a variety of shapes, sizes, and models of plugs within each of the categories, but "typical" examples of some categories are shown below.

Stickbaits: These floating plugs are usually weighted in the rear and move from side to side as the fisherman retrieves them in a series of short jerks.

Jerkbaits: These floating plugs usually dive 2-8 feet below the surface when retrieved with a series of sharp jerks.

Propbaits: These floating plugs have a propeller at one or both ends. The lure can be retrieved with slow, light twitches, sharp jerks, or with a steady, rapid retrieve that churns up the water.

Crawlers: These are used on the surface. They are usually retrieved at a steady rate and make a gurgling sound as they wobble across the surface.

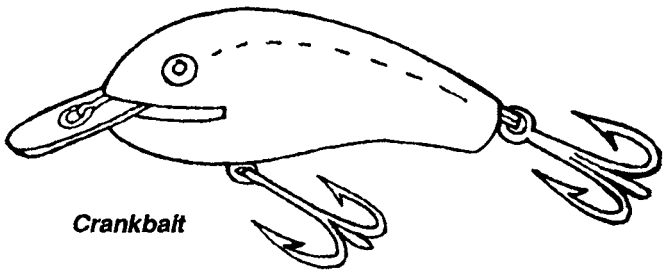
Vibrating plugs: These plugs have the attachment eye on the back and are retrieved below the surface with the head angled down. This gives the plugs a tight, vibrating action.

Crankbaits: These plugs have a lip that makes them dive and wiggle when they are retrieved. There is a wide variety of crankbait shapes.

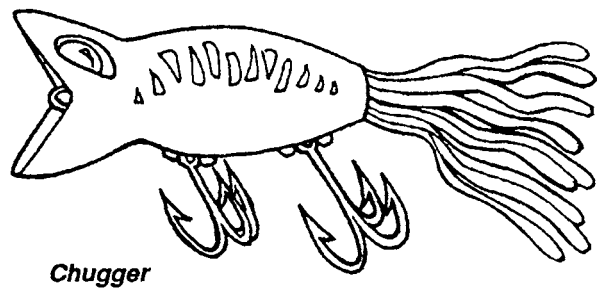
Minnow plugs: These are really a type of crankbait, but they have a distinct shape and swimming action. They look and act very much like minnows.

Trolling plugs: Trolling plugs also come in a wide variety of shapes and styles. They are often hard to cast, run under water, and have a wobbling or darting action.

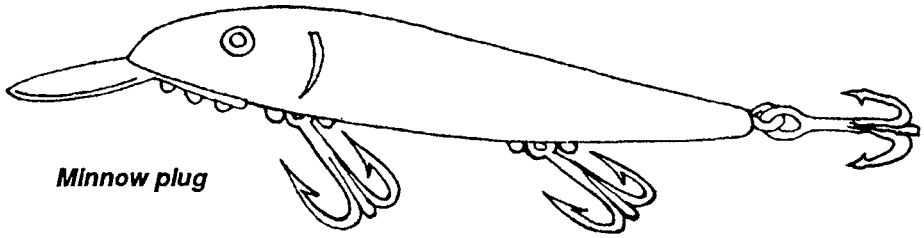
Chuggers: These plugs are twitched or popped along the surface.



Crankbait



Chugger



Minnow plug

CASTING COMPETITIONS

Importance of the topic

Skills in using fishing rods and reels are basic to enjoying the sport of fishing. Anglers may choose from many different types of fishing gear: casting, spincasting, spinning, or fly-fishing equipment. But all anglers want to use the gear well. Sometimes fishermen want to cast a long distance, especially when they are fishing from shore on a large lake. Or fishermen may want to cast accurately. They may want to drop their favorite plug right in the opening of the lily pads where a huge bass jumped.

Casting skills develop with practice. The practice may occur while out fishing or in open area like a yard, parking lot, or even a gymnasium. A casting competition can offer the 4-H'er an opportunity to improve their skills while comparing their technique with others.

What your 4-H'ers will do

Develop their skills casting for distance.
Develop their skills casting for accuracy.

Preparing for the meeting

TIME: 45 minutes to 1 hour

SETTING: A large open area is needed for the casting competition. All members should be reminded to bring their favorite rod and reel. (Fly-casting is a separate activity because it requires so much extra room.)

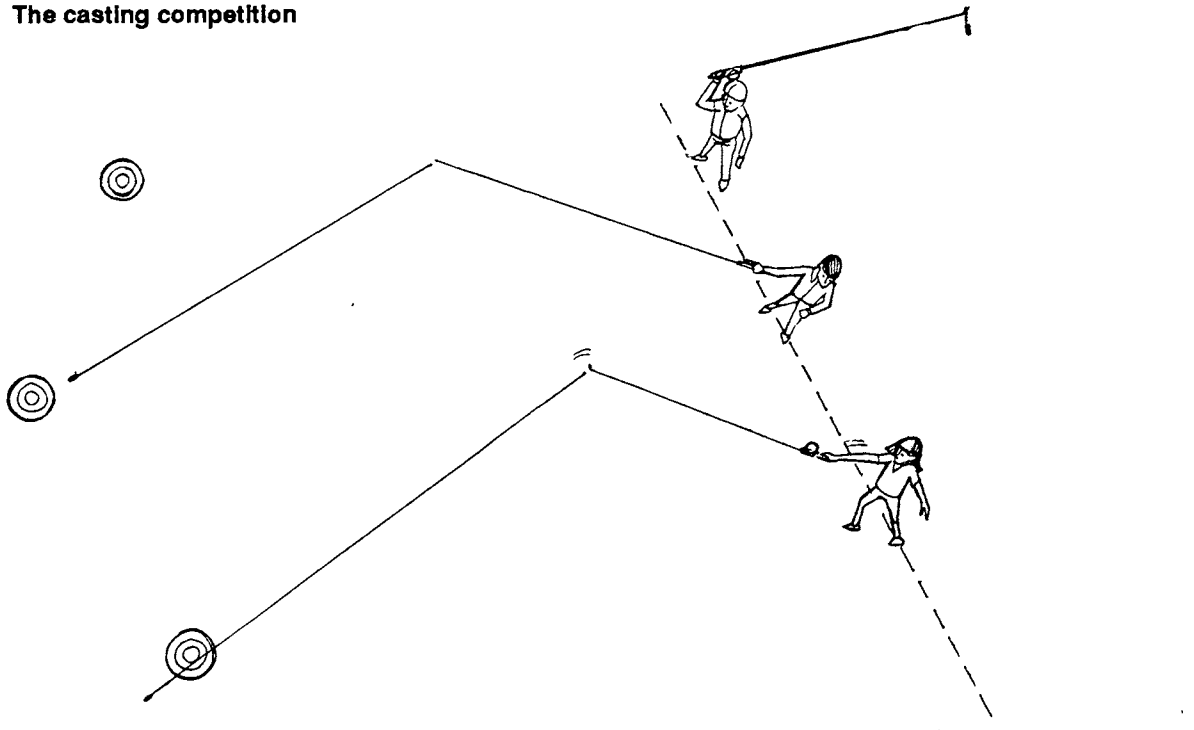
Have the casting area prepared beforehand with a line drawn that shows the casters where they have to stand, and additional lines or measuring tape farther out to show the longest cast.

Garbage can covers, hula hoops, or other similar-sized targets can be used for accuracy casting. A distance of 50-60 feet would be reasonable for casting at targets.

Supplies needed

An assortment of casting dummies or wooden dowels with screw eyes should be available to use instead of fishing plugs. Sticks or other kinds of markers can be used to mark the farthest casts.

The casting competition



It is important to have people help the leader of this activity. Assistance will be needed to keep score and some members will need instruction or encouragement in casting. Inevitably, there will be some members who will also need help getting tangles out of their reels.

Prizes or awards might be offered as part of the competition.

Involving the members

Begin by reminding the members about safety at all times when casting. The leader and assistants should help all members check their line to make sure it is in good shape.

Before anyone makes a cast, look around to make sure they won't hit someone behind or beside them when making their cast. They also need to look ahead where they are casting to make sure there is no one in that area.

Each member who participates gets a casting dummy or a piece of wood to attach to their line as a weight for casting. For a more advanced competition, the members would choose a weight that corresponds to the lightest weight rating of their rod.

For general competitions, assume that the members all have fairly similar rods and use dummies that are in the 1/4-3/8 ounce range. The dummies can be attached by using a snap or by tying them directly to the line.

When everyone is ready, the members move to the casting line and spread out, about two rod lengths apart. If there is not enough room available, the members may divide into groups and take turns casting. When a signal is given, the members begin casting. The leader may want to limit each member to ten casts.

When a person makes a particularly long cast, he or she calls the leader or a helper to mark the place where the casting dummy landed. Use a stick or marker that identifies who made the cast. Everyone stops casting while the marking is being done. The members make as many casts as they can during the alloted time (10-15 minutes work well).

A safety reminder for the members is that it is dangerous to yank on a snagged lure. Some people may get their dummies caught in the grass or on other objects. A hard pull may break the rod or release the lure and cause it to fly back and hurt someone.

When the distance competition is completed, set the targets out for the accuracy competition. Again, the members make as many casts as they can during the alloted time (15-20 minutes is sufficient.) A leader or assistant keeps track of the number of times an individual scores a direct hit on the target.

For score-keeping, prepare a list of participants' names in advance so that tallies can be kept. Using a metal target (like a garbage can cover) is also helpful because everyone can hear a direct hit. The members can report their own direct hits when they occur.

After the competitions, prizes or awards can be handed out. Be sure to emphasize the value of the two types of casting ability and where the skills might be used.

It is also important to note that casting skills alone do not guarantee that a person will catch fish.

Questions to ask

Q. When would it be useful to cast long distances?
A. Sometimes when fishing from shore, a fisherman needs to cast a long distance to reach actively-feeding fish.

Q. When is accuracy helpful in casting?
A. Some accuracy is always needed when casting. There are special situations--for example, fishing for bass in lily pads or heavy cover--when it is essential to place the lure or bait in a specific location.

Q. How can a member learn more about casting?
A. Practice is very important in learning this skill. Enjoy practicing while fishing. Set your own goals for every cast. Books or fishing pros can demonstrate special casting techniques such as underhand casting, flippin', or the sling-shot cast.

PLANNING A FISHING TRIP

Importance of topic

Many times the planning and daydreaming about a fishing trip is as much fun as the trip itself. Unfortunately, many fishing trips are spoiled by poor planning. Learning how to plan a fishing trip can help 4-H'ers make the most of their outdoor vacations. It can also be an enjoyable activity in itself. 4-H'ers gain a sense of responsibility when the safety and enjoyment of others depends upon their planning ability.

What your 4-H'ers will do

Plan a weekend or week-long fishing trip for 4 people.
Present the planning details for each fishing trip to other 4-H'ers for discussion.

Preparing for the meeting

TIME: 15 minutes per presentation.

Supplies needed

At least one good story. Leaders can give members a sense of the purpose of this activity by describing a personal fishing trip that they dreamed about or actually took. Leaders should emphasize the positive and negative aspects of pre-trip planning. A description of a poorly-planned trip might be more informative (and easier to remember) than a description of a well-planned trip.

Involving the members

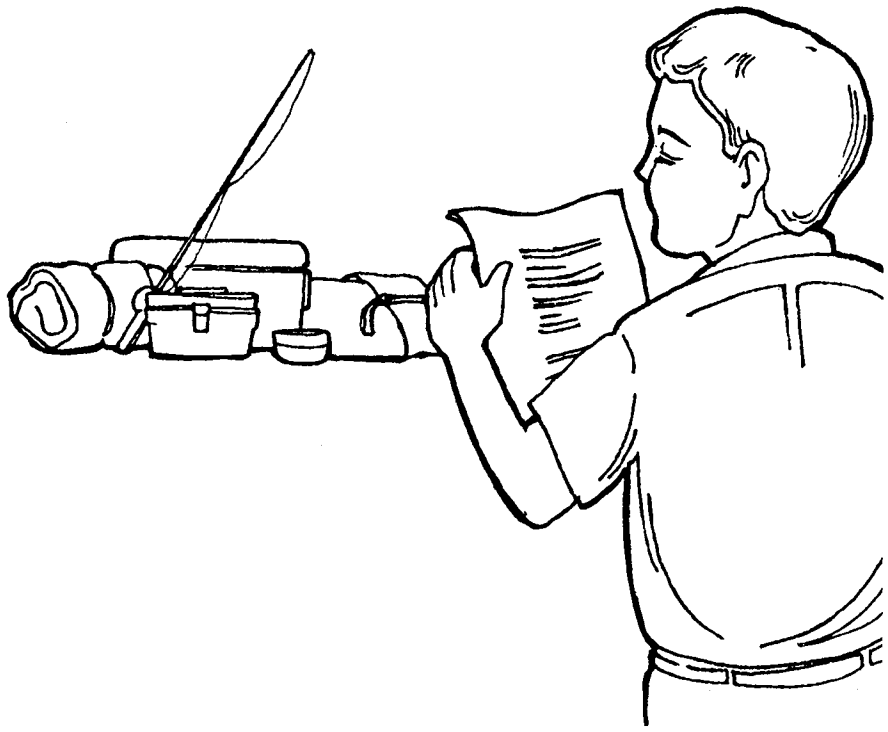
This activity should be assigned at the end of one project meeting and then discussed at the next meeting. As an introduction to this activity, the leader describes the planning process he or she used for a fishing trip that is real or hoped-for (15 minutes). At the end of the meeting, the leader explains that next time each member (or pair of members) will present their planning process for either a weekend or week-long fishing trip (for four people) that they would like to take someday. It can be as simple or complex as they like.

4-H'ers should include the following:

Destination and time of year
List of things to take — as complete as possible
Transportation route (drawn on map) and cost*
Lodging or camping accommodations and cost*
Fishing licenses, bait, tackle, and equipment needed
Fishing game plan or strategy
How meals will be prepared and cost*
Estimated cost* for entire trip for four

*Encourage the 4-H'er to make as accurate an estimate as possible.

At the next project meeting, 4-H'ers will present their trip to the group. The leader and the group can ask the presenter questions to make sure the trip is well-planned and complete. Leaders may want to consider having one trip presented per meeting to spread this activity over the course of one year. You may even want to plan a local fishing outing for your 4-H club. Set up teams and delegate different responsibilities: transportation, food, bait, safety, registration, fish cleaning, etc.



Questions to ask

Q. What should the 4-H'er think about when selecting the time of year for the trip?
A. Things they should consider include the behavior of the fish that time of year; if fishing is usually good at that time; weather; open season regulations; crowding by other fishermen.

Q. What are some questions to ask oneself during the planning stage?
A. Has the 4-H'er included all appropriate equipment and food for the trip? Is estimated travel time sufficient? Have all important costs of the trip been accounted for? Are gas and food stops identified? Has the 4-H'er indicated where the bait will be obtained and how much will be taken?

Frequently forgotten items include a can opener, maps, compass, sunglasses, rain gear, eating and cooking utensils, extra shoes, camera and film, bug spray, landing net.

Q. What are some ways to improvise for forgotten items?
A. A coffee can could be used in place of a forgotten pan; a screwdriver could be used to punch open a can; a garbage bag could be used as a raincoat.

Q. Who could the 4-H'er contact for more information about where and how to fish the lake/river and where to stay?
A. State or Province Department of Tourism; Department of Natural Resources; local Chamber of Commerce; a guide, resort owner, relative, bait shop in the area; or look through back issues of fishing magazines for trip information. The 4-H'er could attend a travel or sport show for additional information.

Q. Has the 4-H'er planned for emergencies?
A. Spare fishing equipment can save the day if equipment is broken or lost. A first-aid kit should be taken. Extra money for repairing breakdowns is important.

Q. Are there regulations associated with his or her trip?
A. Be aware of license requirements, seasons, size limits, possession limits, boating laws, customs laws, and fish transportation laws.

Follow-up

If a 4-H'er actually takes the trip he or she planned, the results can be presented to the rest of the group. A lot can be learned from each experience. 4-H'ers should be encouraged to discuss the problems encountered on a fishing trip as well as things that made the trip enjoyable.

For example, the 4-H'er might talk about items that were left behind and how they were improvised, or the easy, good-tasting meals and snacks they made on the trip.

USING A LAKE (HYDROGRAPHIC) MAP

Importance of the topic

Of all the fishing accessories available to anglers, maps may be the most important. There are a variety of good maps which help anglers locate lakes and their access points. The most important map anglers have is a lake map (also known as a hydrographic or contour map). Understanding how to read and use a contour map can greatly improve a fisherman's chances of locating fish on new as well as familiar lakes.

What your 4-H'ers will do

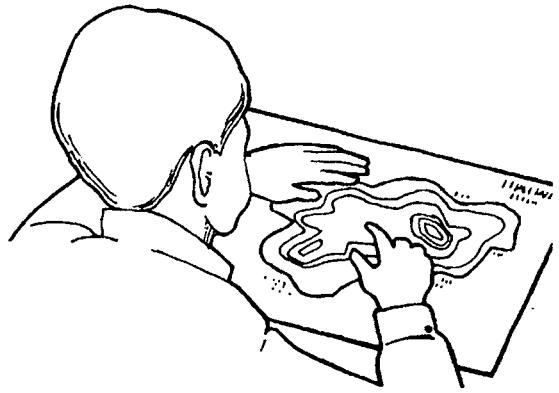
Become familiar with the information found on a contour map.
Determine how to use this information to improve fishing success and increase boating safety.

Preparing for the meeting

TIME: 30-60 minutes

Supplies needed

Copies of a contour map for each member, preferably of a lake familiar to the members and one with a good variety of structure. Maps are available in some fishing magazines, bait shops, and stores which carry specialty maps.
colored pencils for making notes on lake map copies
Optional: overhead projector to show a large diagram of the lake the members are working with



NOTE: This activity is most successful if 4-H members know where certain fish species are found in a lake. Learning location preference and habits of the fish species sought is an important prerequisite to a successful contour map exercise.

Involving the members

Each member should have a copy of the contour map the group is working with and a colored pencil for taking notes. The group should begin by finding the lake's name, location, and size. Does the map indicate when it was printed?

From the map in front of them, ask the group to pick out specific features and explain why they are important to fishermen. See if the members can find the following features:

- public access
- steep drop-offs
- gradually sloping bottoms
- the deepest hole or area of the lake
- inlets and outlets
- navigational hazards
- low marshy areas
- islands
- shallow bays
- navigational directions
- different types of lake bottom: rocks, sand, silt, weeds
- points of land extending into the lake
- inside turns of weed lines or drop-offs

Once the 4-H members have gone over the general features of the map, discuss which species of fish may be found in that lake. Determine where those species will most likely be found based on their habitat preferences throughout the year. Pay particular attention to the spawning habitat of each species.

A leader might use the example on the following page to help the 4-H'ers make decisions on how to locate a certain fish species during different times of the year..

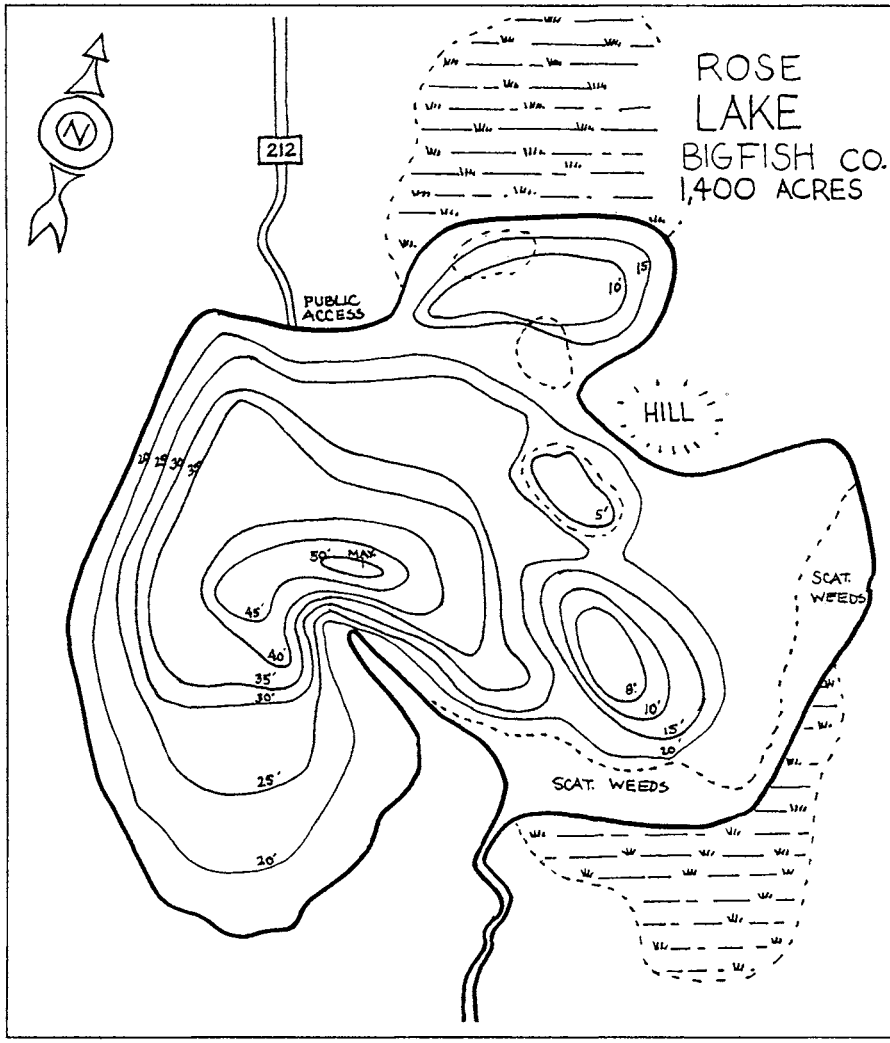
Supporting activities

Take the group to a lake and, using a contour map of the lake and a depth finder, see if the group can locate certain areas depicted on the map. (If a depth finder is not available, use a weight attached to a rope or string which is marked at 1-foot intervals. Mark the 10-foot intervals in a different color.)

Invite a resort owner or other person familiar with the lake you are using to visit with the group about features of that lake not shown on their maps. Add these to the maps for future reference.

Go out at night with a spotlight and shine at the lake bottom. Try to identify any fish species you see. Record information such as water temperature, water depth, bottom structure, and time of the year. See if these findings correspond with the typical location preference of that fish species. Many fish change location from day to night. (This activity works best in clear lakes and should be done with prior approval of a local DNR official).

Take a snorkeling trip to a fish's living room. Record information as in the previous activity.



Jim is a sixteen-year-old who attended a leader training where he caught his first largemouth bass. He decided that the following spring he would take a group of 4-H teens from his 4-H club fishing on opening weekend of bass season to introduce them to the sport.

Jim knows from studying his DNR report on the largemouth bass that it is a member of the sunfish family, and they spawn in May and June when the water temperatures reach 62-65 degrees. He also knows that they spawn in shallow, protected, weedy bays, preferably in areas with bulrushes and lily pads.

After checking for good bass lakes in his area, Jim selected Rose Lake. It is supposed to have a good population of bass and a large bay that will give the group plenty of room to spread out as they fish.

Based on the location preference and spring habitats of largemouth bass, determine from the contour map the best locations to try fishing.

FISH PRINTING

Importance of the topic

Making a fish print is one way to preserve a record of a fish the 4-H'er has caught. It is also a great way for the 4-H'er to look more closely at the fish.

The purpose of a fish print is to create a work of art: an attractive reproduction of a fish that shows all of its fine detail. While trying to show aspects of the fish in their print, 4-H'ers can learn about fish and create a work of art.

What your 4-H'ers will do

Use art to create a memento of a fish that has been caught.
Closely observe the external parts of a fish.

Preparing for the meeting

TIME: 30-60 minutes

SETTING: Tables or flat working areas are needed.

The project members need to have a source of fish for this activity. Flat fish, like sunfish and crappies, work the best, but other fish can also be tried. The activity could be done after the project members have all been on a fishing trip; just store the uncleaned fish in a refrigerator or freezer until they are ready to make prints.

Supplies needed

tempera paint, india ink, printing ink, or other paint (watercolors do not work well)
paint brushes
rice paper, newsprint, paper towels, or other slightly absorbent paper
cardboard
straight pins

Involving the members

Explain to the members that each person is going to try to make a detailed print of their fish. The first step is to wash and wipe the protective slime off the fish. Then place the fish on a piece of cardboard and pin its fins so that they are displayed in an erect position.

When the fish has been prepared, brush the paint or ink over the entire surface of the fish. Allow the paint or ink to dry for a couple of minutes. Then cover the fish with the paper (newsprint, paper towel, rice paper, or other paper) which will be used to make the print.

Use fingers to press this paper evenly over the entire surface of the fish, emphasizing the outline. Try not to shift the paper from its original position while doing the pressing. Peel the print off carefully. Then let it dry.

Try making two prints of the same fish, one from each side. Cut them out, staple the edges together and stuff it for a 3-D effect. Hang several from a string to make a mobile.

Experiment. Try different kinds of paint, ink, and paper to see what gives the best prints. Include other objects in the print, like twigs or plants, to make an underwater scene.

Try combining a small and a large fish on the same print. Find out which techniques make the most distinct print. If the fish get messy, they can be washed off and used again.

Using the proper type of paint or ink, fish print t-shirts can also be made.

Questions to ask

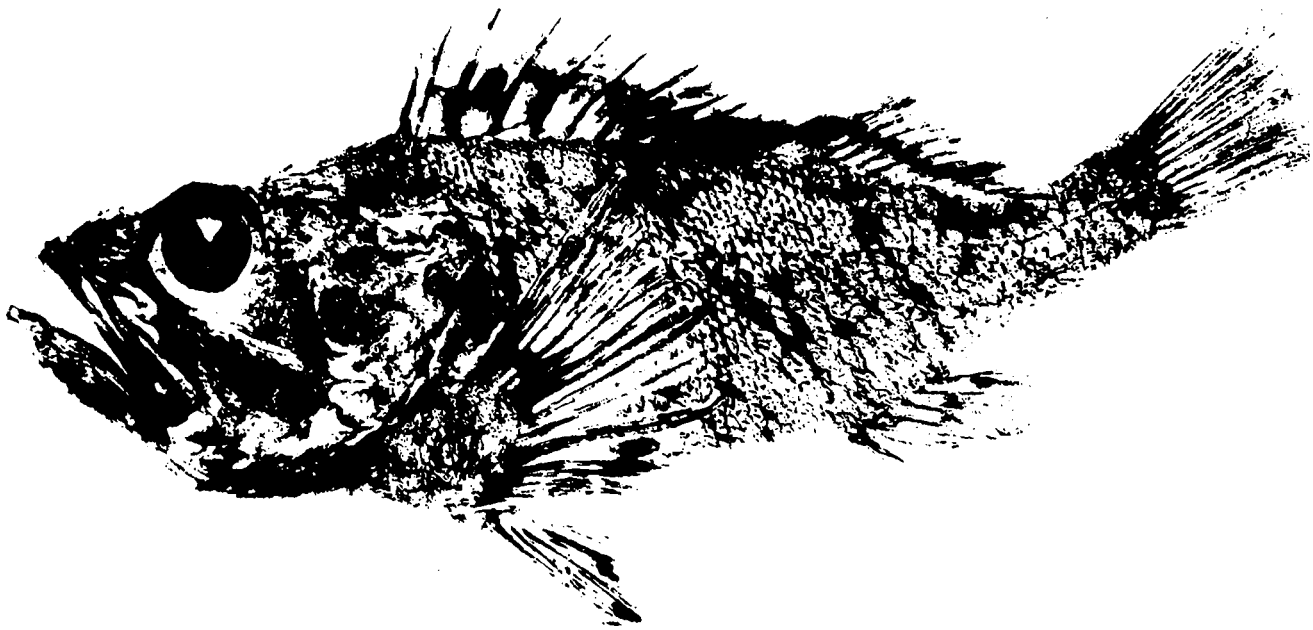
Q. What external parts of the fish can be observed in a fish print?
A. On a clear print the fins (pelvic, pectoral, anal, dorsal, and caudal fins), the operculum (gill cover), the eyes, the mouth, the scales (if present), and the lateral line can all be seen.

Q. What techniques help produce detailed fish prints?
A. A thin, even coat of paint/ink, gentle, even pressing with the fingers, and carefully peeling off the paper help in making detailed fish prints.

Q. What other methods could be used to preserve a record of a fish that has been caught?
A. Photographs, drawings, plaster casts, wood models, taxidermy mounts, etc. are ways of preserving a record of a fish.

Q. Can you clean and eat the fish when you finish making the fish prints?
A. Probably the fish will have deteriorated during the printing and would not taste as good as fresh fish. But if the fish have been well cared for and a non-toxic paint has been used, the members could try cleaning and eating them.

Fish print



KNIFE SHARPENING

Importance of the Topic

Everyone who cleans a fish learns the value of a sharp knife. Whether the fisherman is dressing a fish, filleting it, or using some other special cleaning technique, a sharp knife will make the job much easier. Using a sharp knife usually results in wasting less fish. A sharp knife can be safer to use than a dull knife.

What your 4-H'ers will do

Inspect the sharpness of the fish-cleaning knife.
Sharpen their favorite fish-cleaning knife.
Test the sharpness of their knife.

Preparing for the meeting

TIME: 30-45 minutes

Supplies needed

Magnifying glasses are useful for inspecting the sharpness of a knife. Each member will need a sharpening stone. Some stones use a light oil. Rags or paper toweling are needed to clean off knives and fingers. Several pieces of paper should be available for testing the sharpness of the knives.

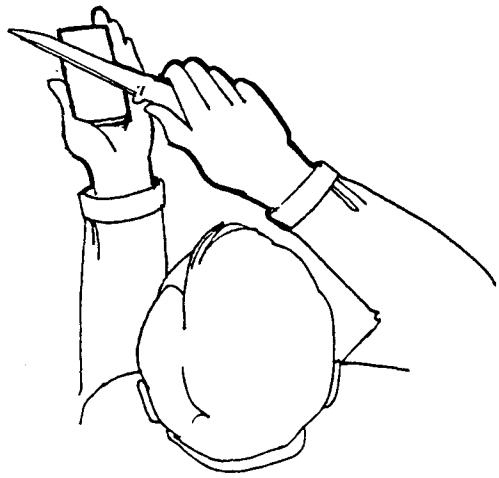
Have an emergency first-aid kit available.

Involving the members

Begin the activity by reminding the members to be careful when handling knives. There should be one leader to supervise each 3-4 members.

Ask the members to take out their knives and look at the cutting edge. What do they notice? Sometimes it is helpful to have a bright light shining on the cutting edge to help make nicks on the blade more noticeable. If magnifying glasses are available, look closely at the blade.

Demonstrate the proper technique for sharpening the blade. The sharpening stone should be placed on a flat surface or held carefully on the end away from the direction that the blade will be pushed or pulled.



The knife blade should be held at about a 15-20 degree angle to the stone and pulled and pushed across the stone as if cutting a thin slice. Work on one side until a slight burr forms along the opposite edge of the blade. Then turn the knife over and work on the other side until a burr develops.

Turn the knife again and slightly increase the angle and decrease the pressure on the blade. Continue working on the blade while alternating sides until the knife appears sharp. (Optional: A leather strop or a steel can be used to give a blade its final edge.)

To help members learn what a 15-20 degree angle is, cut a 15 degree and a 20 degree wedge out of a piece of wood. Lay the wood on the sharpening stone. Then lay the knife on the wedge to show the angle to be used when sharpening it. Remove the wedge before sharpening the knife.

With these few instructions, let the members try their own skills at sharpening.

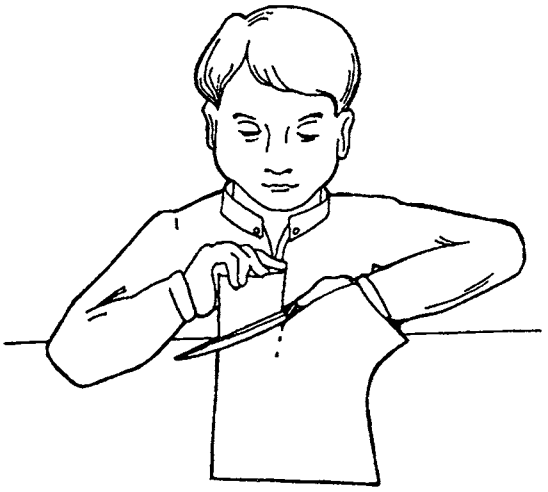
When everyone is finished, ask them to again inspect their blades. To test the sharpness of the knife, have someone hold a piece of paper firmly between two hands. Place the blade of the knife on the paper and draw it lightly across the edge of the paper. A sharp knife will cut the paper smoothly. A dull knife will need more pressure and produce more vibration in the paper.

Questions to ask

Q. What kind of knife is the best to use when cleaning fish?
A. The choice of knife will depend on the fish-cleaning method that the member uses. A knife with a long, thin, flexible blade is preferred by many anglers who like to fillet their fish.

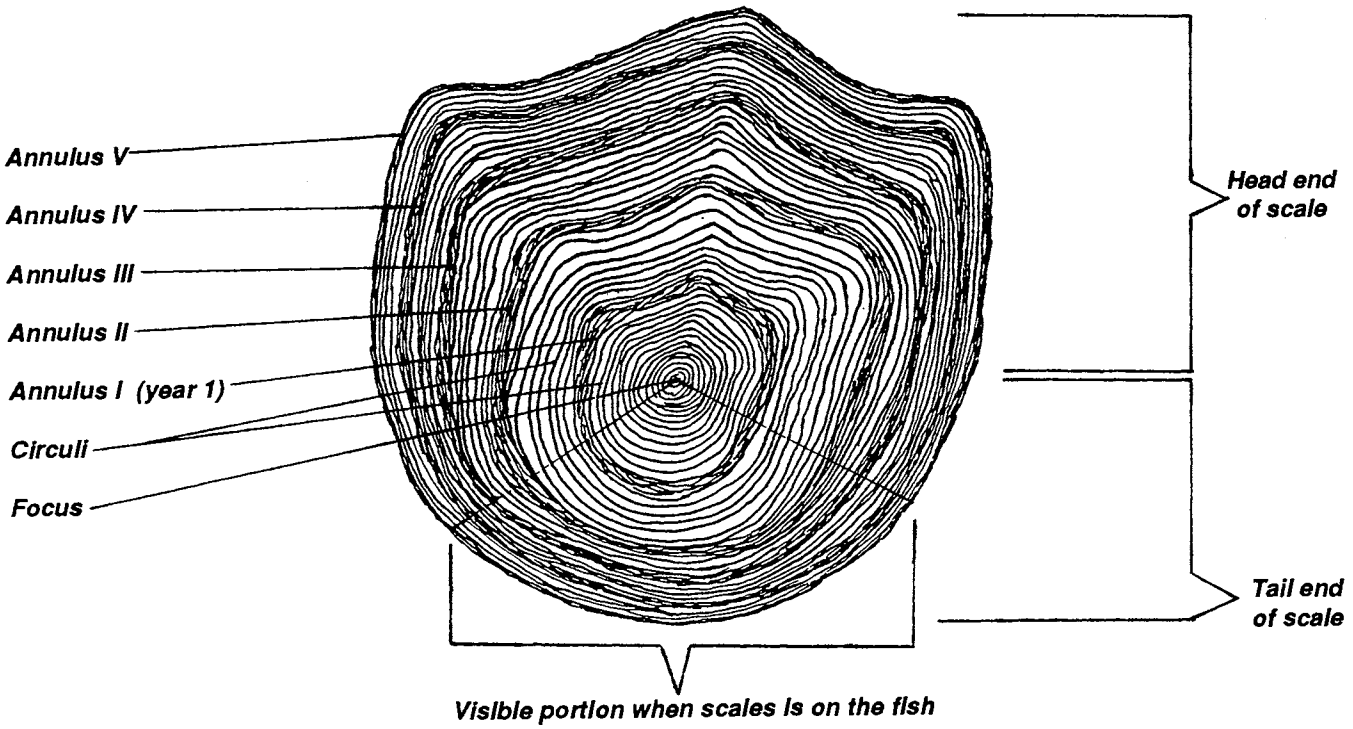
A sturdier blade is preferred by other anglers, particularly those who have to cut through strong fish bones. A knife with a short, rounded blade is preferred by those who dress out lots of fish.

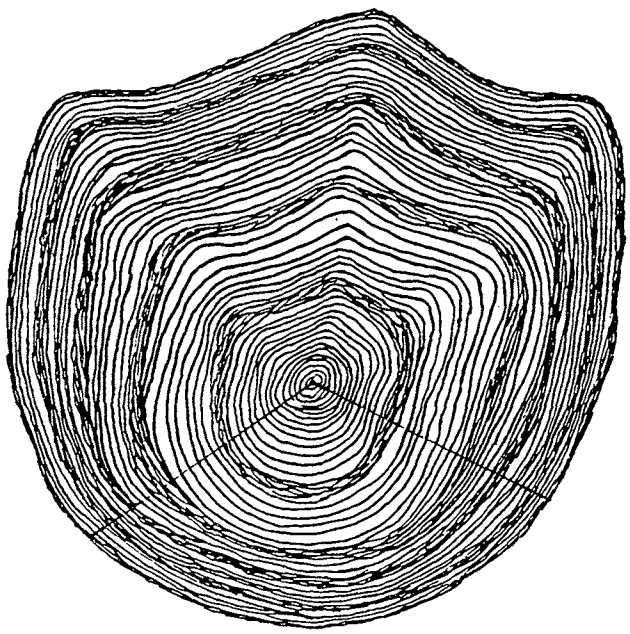
Q. Are all knife blades made of the same kind of metal?
A. Some blades are made of "soft" steel. This type of steel loses its sharpness more quickly than "hard" steel, but it is much easier to sharpen. "Hard" steel knives hold their edge much longer, but are hard to sharpen. What type of blade does each member think they have?



NOTES:

Scales from a soft-rayed fish





Average total length in inches of Minnesota fishes at the end of each year

	YEAR								
	1	2	3	4	5	6	7	8	9
Bluegill	1.9	3.4	4.9	6.1	7.1	7.8	8.3	8.6	9.1
Pumpkinseed	1.7	3.1	4.4	5.5	6.4	7.2	7.7	8.1	8.5
Black crappie	2.4	4.8	6.8	8.3	9.5	10.5	11.6	12.3	12.8
Rock bass	1.6	3.0	4.5	5.9	7.1	8.3	9.1	9.6	10.1
Yellow perch	2.6	4.5	6.0	7.3	8.4	9.3	10.0	10.8	11.3
Largemouth bass	3.5	6.7	9.3	11.5	13.1	15.1	16.3	17.6	18.1
Smallmouth bass	3.9	7.3	10.0	12.2	18.2	20.5	--	--	--
Sauger	4.3	7.9	10.4	11.8	13.0	14.2	14.3	--	--
Walleye	5.1	9.0	12.3	15.1	17.3	19.2	20.9	22.1	23.4
Northern pike	7.8	13.2	17.7	21.1	24.2	26.8	29.0	31.1	33.3
Muskellunge	6.9	12.5	17.1	21.5	25.8	29.0	33.4	39.1	41.8
Rainbow trout	4.9	9.1	12.8	16.1	20.5	--	--	--	--
Lake trout	5.4	9.0	12.4	15.6	18.4	20.4	23.1	25.5	27.9
Carp	6.8	15.6	17.8	21.6	25.8	28.9	29.4	31.4	--

Source: Minnesota Department of Natural Resources

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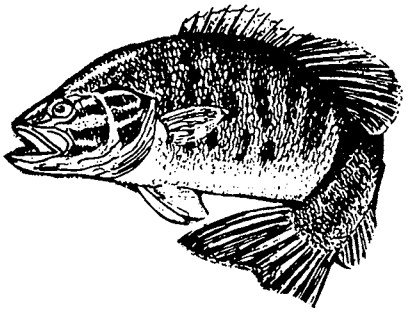
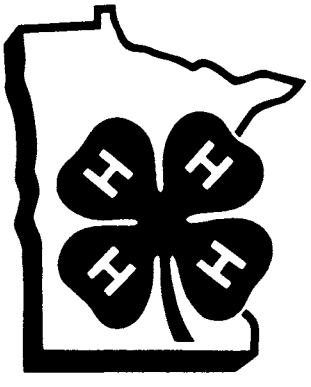


St. Louis River Recreation Association



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