



Mississippi 4-H Sportfishing

Reel in the Fun!



MISSISSIPPI STATE UNIVERSITY™
EXTENSION

How to Use This Manual

The Mississippi 4-H Sportfishing manual educates 4-H'ers on the basics of fishing as a form of recreation as well as a source of gathering local food for the family. The manual is divided into three chapters, each building off the other. Topics range from fishing basics to additional skills and knowledge that are useful for any angler to acquire and master.

Chapter 1 covers the most basic topics and principles needed to begin the journey toward becoming an angler. Chapter 2 covers more specific and advanced topics to give beginner anglers additional knowledge to further develop their skills. Chapter 3 covers a few remaining topics that are beneficial to 4-H'ers who have the ambition to become avid and lifelong anglers.

These chapters can be taught as the instructor sees fit based on the interest level of their group of 4-H'ers. For example, you may wish to simply introduce your 4-H'ers to the basics and provide them with a positive experience and view of fishing for recreation. Under this scenario, you may only want to cover the topics in Chapter 1. You can use some or all of the lessons in this chapter and end the lessons with a supervised fishing trip. After these introductory lessons and fishing experience, you may have 4-H'ers who show strong interest and would enjoy moving on to lessons in the subsequent chapters. However you choose to order the lessons provided in this manual, always make sure to make it a fun, safe, and positive experience.

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Chapter 1: Becoming an Angler

Chapter 1 covers the most basic skills and knowledge one needs to begin to fish as a recreational activity. It provides basic information and activities associated with the history of fishing, the gear or “tackle” used to catch fish, and the skills required to fish effectively. The specific lessons in this chapter include:

- LESSON 1: HISTORY OF FISHING
- LESSON 2: RODS, REELS, AND LINES
- LESSON 3: BAIT AND LURES
- LESSON 4: KNOT TYING
- LESSON 5: CASTING



Lesson 1: History of Fishing

Fishing began as a means of catching food to survive. Although many people still fish for this reason, fishing has evolved into a recreational activity fit for people of all ages. This lesson provides 4-H'ers with a brief overview of the origins of fishing and the development and evolution of fishing equipment.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Explain the origins of fishing.
- Describe the first fishing rods, reels, and lines.
- Have the option to build a primitive fishing pole and gorge.

PREPARATION

If using natural bamboo or cane, cut the poles to a length of 6–7 feet and trim the limbs and leaves from the stalk. Allow the poles to dry. If the bamboo's texture is too rough to hold, you can add a clear varnish. Also, have on hand an 8- to 10-foot length of fishing line for participants to use as a reference when cutting line for their poles. **Newly cut poles will need to dry for 2 weeks before teaching the lesson**, so plan accordingly.

BACKGROUND

Catching fish to eat has occurred for thousands of years. Various types of poles, nets, and traps were and are commonly used to catch fish in many cultures. Instances of fishing have been recorded as early as 2000 BC in Egypt, as well as in ancient Greek and Roman writings. There are also early Chinese accounts of fishing with a hook made from a needle, silk line, and bamboo pole.

As the practice of fishing became more widespread, the gear used to fish (commonly referred to as *tackle*) developed and evolved, as well. One of the earliest methods used to catch fish with bait was with a device called a *gorge*, the origin of today's fishing hook. A gorge consisted of a small piece of bone or stick sharp-

Ages

8–18

Safety Considerations

Be careful when handling sharp objects such as scissors and hand-held saws. Help participants as appropriate to their age and ability.

Materials

- ¼-inch wooden dowel rods (total of 1 inch per learner)
- Pencil sharpeners
- Fishing line (total of 8–10 feet per learner)
- 6- to 7-foot bamboo poles (1 pole per learner)
- Scissors
- Bow saw (or similar hand saw) for cutting dowel rods



ened on both sides and secured off-center to a line or string. Bait was wrapped around the gorge. When a fish swallowed the bait, the angler pulled the string tight, causing the sharp points of the gorge to get caught in the fish and allowing the fish to be pulled in. As copper and bronze became more available, metal hooks were created and used in place of gorges.

Poles and rods are used to help get the bait farther out in the water. Early poles were made from bamboo and wood and were only about 3 feet long. The baited hook was attached to the rod by a line made from materials such as silk, horsehair, cotton, and linen. Modern fishing rods come in a variety of sizes and can be made from more sturdy and flexible materials, such as fiberglass, graphite, and carbon fibers. Despite the advances in fishing equipment, many anglers continue to enjoy using primitive tackle including cane poles. It wasn't until the 1930s that nylon monofilament line was developed and quickly became a popular line of choice for many anglers.

As anglers began to need additional fishing line capacity, reels with mounts to stow line were developed. While rudimentary reels were designed by the Chinese in the 3rd century BC, it wasn't until the 18th century that modern reels were developed in England. Although the practice of fishing has evolved through time, the basic tools have not. The same basic elements are still used: hooks, rods, reels, and line.

ACTIVITY

- Engage your 4-H'ers by asking questions such as:
 - » "How many of you have made your own fishing pole?"
 - » "What's the strangest thing you have used to catch a fish?"
- Lead the group in a conversation about early fishing tools and explain how they will be making a gorge today.
- Allow 4-H'ers to complete these tasks, assisting when needed.
 - » Cut with a handsaw a 1-inch dowel piece and sharpen both sides of it using a pencil sharpener until both ends are pointed.

- » Measure (or use pre-cut reference line) and cut the supply of fishing line into one 8- to 10-foot section per participant.
- » Tie one end of the section of fishing line tightly around the pointed dowel piece, positioning it slightly off-center. Tie the remaining free end of the fishing line tightly to one end of a bamboo pole.
- Once materials are put together, walk the learners through how their new fishing pole and gorge can be used to catch fish.

ASSESSMENT

Test participants' comprehension by asking the following questions:

- What are the four main components of fishing gear?
Hooks, rods, reels, and fishing line
- Metal fishing hooks replaced which type of early fishing tool?
The gorge
- What material replaced silk, horsehair, cotton, and linen as fishing line in the 1930s?
Nylon monofilament

RESOURCES

Survival Fishing: How to Make a Gorge Hook

<https://www.fieldandstream.com/blogs/field-notes/survival-fishing-how-to-make-a-gorge-hook>

Fishing Basics for Beginners: The Gear You Need to Get Started

<https://www.takemefishing.org/blog/april-2018/fishing-basics-beginners-the-gear-you-need/>





Lesson 2: Rods and Reels

Equipment has evolved substantially since the use of rods like the ones constructed in Lesson 1. Today anglers can use a wide assortment of gear to catch fish. Casting rods and reels, spinning rods and reels, spin-cast combinations, and fly-fishing combinations, along with various fishing lines, are commonly used today.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Identify spinning, baitcast, spin-cast, and fly reels.
- Explain how each reel is used.
- Describe the weights and types of fishing rods.
- Explain reel drag settings.
- Discuss the different fishing lines.

PREPARATION

Gather baitcast, spinning, spin-cast, and fly-fishing reel and rod combinations as examples for learners to view.

Ages

8–18

Safety Considerations

None

Materials

- Casting, spinning, fly-fishing, and spin-cast reels
- Casting, fly-fishing, and spinning rods
- Braid-line, fluorocarbon, monofilament, and fly-fishing lines

BACKGROUND

Anglers use fishing rods and reels to catch fish. We are going to break down the different fishing gear to learn about the different ways to catch fish.

RODS

All fishing rods have similar components that allow anglers to cast bait out into the water. Rods are made from a variety of materials, including bamboo, wood, fiberglass, and carbon fiber. They contain many components that allow anglers to cast out line.

Fishing rods have guides that run from the tip to the butt guide, which is the last guide before the reel. Just in front of the reel, there is a forward grip and then the reel seat. The reel seat is where the fishing reel sits, while a reel screw and clamp secure the reel into this seat. Just behind the reel seat, there is another handgrip.

Each fishing rod has a specific *action* (a point along the rod where it flexes) and *power* (how much pressure it takes to flex the rod). This information can influence how you use the rod effectively. There are multiple types of rod designs, and some are designed to be used with specific types of reels.



REELS

There are four main types of fishing reels: **spin-cast**, **spinning**, **baitcast**, and **fly**. Choosing the right reel can be difficult for anglers. Each reel has its advantages and disadvantages, as well as differing skill levels required to operate them. Most reels share the same basic components: the reel spool, reel foot (where the reel attaches to the rod), and reel handle.



Many young anglers start their journey with a **spin-casting** reel. These allow anglers to cast out baits without the risk of tangling up the line. These are tangle-free because they feature a metal housing over the line spool and other components of the reel. The angler pushes a button with their thumb to release line from the spool. In addition to being easy to use, they are generally affordable and are suitable for bank fishing.



The **spinning** reel is one of the most popular reels among anglers. The spinning reel attaches to the bottom of the rod, making it easier to hold and handle. Spinning reels have a metal bail that, when flipped over, allows the line to unspool; when closed, the line is locked, keeping it on the spool. Overall, this reel is easy to handle for beginner anglers and is slightly more versatile than a spin-casting reel.



The **baitcast** reel is generally considered one of the more advanced types of reels and is used by more experienced anglers. This reel has more moving parts than the other reels described in this lesson. Once you master it, a baitcaster can give you more precision and power than other reels. The baitcaster reel sits on top of the

rod handle, and the spool is semi-open. One of the greatest advantages of this reel is that it allows the angler to cast out as much line as they want and at the speed they want. Overall, the baitcaster reel is one of the most durable, precise, and powerful reels, but it is also one of the most difficult to master.



Similarly to the spinning reel, the **fly-fishing** reel attaches to the bottom of the rod. There are two different types of fly-fishing reels, the automatic and the standard. The automatic includes a line guide that allows the line to enter and exit the reel. It also has a release lever and a spring-winding mechanism that allows an angler to access the interior of the reel. The standard fly reel does not have the release lever or the spring-winding mechanism. It does have a release button that allows access to the reel spool.

LINE

Fishing line is what allows the rod and reel to fight a fish that has taken an angler's lure. Lines come in different forms, including monofilament, fluorocarbon, and braid. Each has its strengths and weaknesses. Fly-fishing lines are unique and have many different qualities.

Monofilament line is a singular strand of fishing line that stretches when an angler sets the hook. Lures commonly used with monofilament line include soft plastics, crankbaits, and other moving baits. Monofilament fishing line is good to use when the water is clear because wary fish will not be able to see it.

Fluorocarbon fishing line is thicker and is useful in more cover-heavy areas. This fishing line has more stretch and is stronger than monofilament lines. Lures commonly used with fluorocarbon line include Texas-rigged soft plastics, crankbaits, jigs, and other moving baits. Fluorocarbon fishing line works well in areas where the fish are staying close to cover.

When multiple strands of a line are blended, they create a **braided** fishing line. This fishing line is



extremely stout and is useful in bringing fish out of thick vegetation. Braided fishing lines have little to no stretch. Braided line floats, so topwater, buzz, and other surface baits work well with them.

Fly-fishing reels use multiple line types in a single reel, including the tippet, leader, and backing. The tippet is like a monofilament fishing line. This small, clear line is essential when presenting a fly to trout in a clear stream. The leader is a thicker, heavier fishing line that is used to cast out the light fly. The backing line attaches the tippet and leader to the fly reel.

ACTIVITY

- Engage your 4-H'ers by asking questions such as:
 - » “Have any of you used any of these fishing reels and rods before?”
 - » “Have you used more than one type of reel?”
 - » “Do any of you have any preferences between these combinations?”
- Display all the different fishing gear and allow learners to pick up and handle everything.
- Explain the different pieces of gear and allow students to ask questions.

ASSESSMENT

Test your learners' comprehension by asking the following questions:

- What are the four different reels that we discussed today?
Baitcasting, spin-cast, spinning, and fly-fishing reels
- What are fishing rods made from?
Bamboo, wood, carbon fiber, and fiberglass

RESOURCES

Best Fishing Rods

<https://www.takemefishing.org/how-to-fish/fishing-gear-and-tackle/best-fishing-rods/>

How to Choose a Fishing Reel

<https://www.takemefishing.org/how-to-fish/fishing-gear-and-tackle/how-to-choose-a-fishing-reel/>

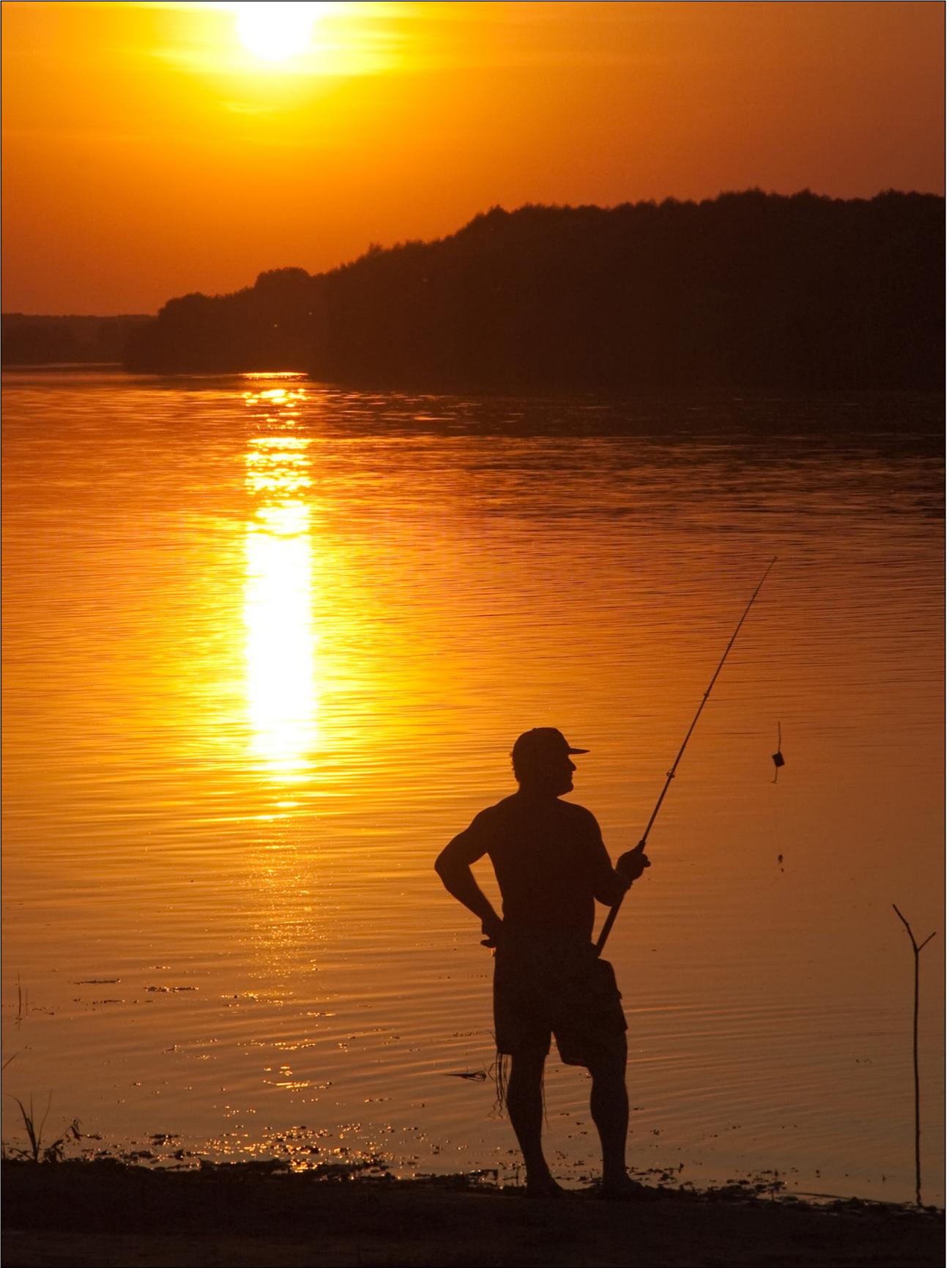
How to Set Up a Fly-Fishing Rod and Reel: From Reel to Fly

<https://guiderecommended.com/setup-fly-fishing-rod-reel/>

A Fishing Line Comparison Chart for Sea Anglers

<https://www.go-saltwater-fishing.com/fishing-line-comparison.html>







Lesson 3: Baits and Lures

Rods and reels allow anglers to cast out fishing line. Baits and lures entice fish to take the hook so the angler can catch it. A wide variety of baits can be used, from live baits to soft plastics. Anglers can use various kinds of baits and lures to target fish during different times of the year when they are feeding on specific types of food.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Identify common baits.
- Identify artificial lures.
- Describe how baits and lures are used.

PREPARATION

Gather a wide array of hard plastic and soft plastic lures, live bait (worms, crickets, etc.), and photos of different bait fish that are commonly used in fishing. Some examples of bait fish are gizzard shad, bluegill, and fathead minnows.

BACKGROUND

You can use natural forage (also referred to as “live bait”) or artificial lures to entice fish.



Live bait includes items like worms, crickets, leeches, and a variety of bait fish that predatory fish eat. When using live bait, it is important to understand what will entice the fish you’re targeting. For exam-

ple, if you want to catch small panfish, a small worm is the perfect bait. One of the difficult things about using live bait is learning to hook them properly. See the Resources section to learn how to hook the different kinds of bait.

There are many choices when it comes to artificial lures that mimic fishes’ natural forage. **Hard plastic** lures are constructed of tough plastic with hooks attached. These lures are great at replicating bait fish and crawfish swimming through the water. These baits



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8–18

Safety Considerations

None

Materials

- Soft plastics, hard plastics, and flies
- Hooks, weights, and snaps



have diving depths of 1 to 30 feet or deeper. In most cases, the depth is controlled by the length of the bill on the front of the bait. For baits that do not have this bill, depth is determined by the amount of time that you allow it to sink and how slowly you reel it in.

Soft plastic baits are constructed of softer, more pliable plastics. These baits are designed to mimic specific prey, including bait fish, worms, crawfish, and other water creatures. These baits can be used as trailers for spinner baits, buzz baits, and jigs, which give them more life-like action. They can also be used alone in the Carolina rig, Texas rig, wacky rig, and others.



Lures are meant to be used specifically with fly rods and are constructed

of thread, feathers, hair, and tinsel. These typically are referred to as “flies” rather than “lures.” Anglers can use these materials to create a wide assortment of flies, including dry flies, wet flies, streamer flies, nymphs, bass bugs, cork minnows, hair houses, cork-bodied frogs, rubber legs, and many other flies. These lures are primarily used for trout and salmon fishing to mimic the small minnows and other prey items those species tend to consume. However, you can use them to catch any number of other species.



ACTIVITY

- Engage your learners by asking questions such as:
 - » “Who here has experience with any of these baits?”
 - » “Does anyone have a favorite fishing lure/ bait?”
 - » “Has anyone ever created their own fly?”

- Review the various baits and describe what each example is and what forage it is representing.
- Present your learners with a scenario, such as a grass pond that has bluegill, crawfish, and worms living in it. Ask them to select the bait they would use in this scenario. Review each selection and talk about why that bait would or would not work in this scenario.

ENRICHMENT

If you have a 4-H'er who is extremely interested in the fly-fishing portion of this lesson, encourage them to begin hand-tying their own flies.

ASSESSMENT

Test your learners' comprehension by asking the following questions:

- What is a forage item?
Forage is something that fish eat or consume.
- What are some common live baits anglers use to catch fish?
Bluegill, worms, and shad

RESOURCES

Hook Placement when Fishing with Live Bait

<https://www.sportfishingmag.com/how-to-catch-more-fish-with-live-bait/>

The Only Four Bass Fishing Rigs You Need to Know

<https://www.fieldandstream.com/four-must-know-soft-bait-rigs/>

Fly-Fishing 101: Introduction to Freshwater Flies

<https://uwotf.com/blog/intro-to-freshwater-flies/>





Lesson 4: Knot Tying

Tying knots is an important aspect of fishing. A well-tied knot helps keep your line attached to your hook, which can be the difference between reeling in a fish and losing one. There are plenty of useful fishing knots; this lesson will teach 4-H'ers how to identify and tie four types of knots fit for all experience levels.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Identify four different knots (improved clinch, double surgeon's loop, snell, and palomar).
- Demonstrate how to tie the four different knots.

PREPARATION

Cut the para cord into 2-foot lengths before participants arrive for easy distribution. Make enough copies of the “how-to” guides found in the Resources section for each of the four knot styles so you and participants can have one of each for reference.

Ages

8–18

Safety Considerations

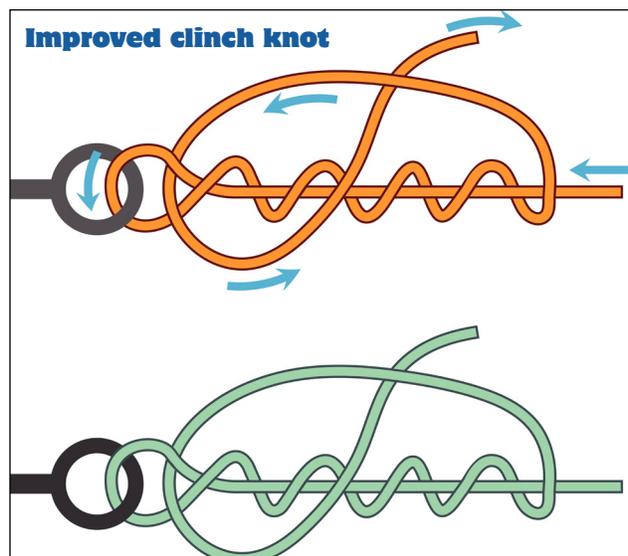
None

Materials

- 3 inches by ¼ inch eye bolts (1 per learner)
- ⅜ inch para cord rope in 2-foot sections (1 section per learner)
- Scissors/knife

BACKGROUND

Tying a good knot is crucial for fishing success, no matter your age or skill level. Not every type of knot serves the same purpose. Some knots allow anglers to achieve specific goals when fishing, while others are best suited for different kinds of lines and hooks. For example, terminal knots are used to tie a line or leader to a hook or lure, whereas loop knots allow lures to move freely. Regardless of the type, a well-tied knot should maintain line strength, remain secure, and stand up to pressure.

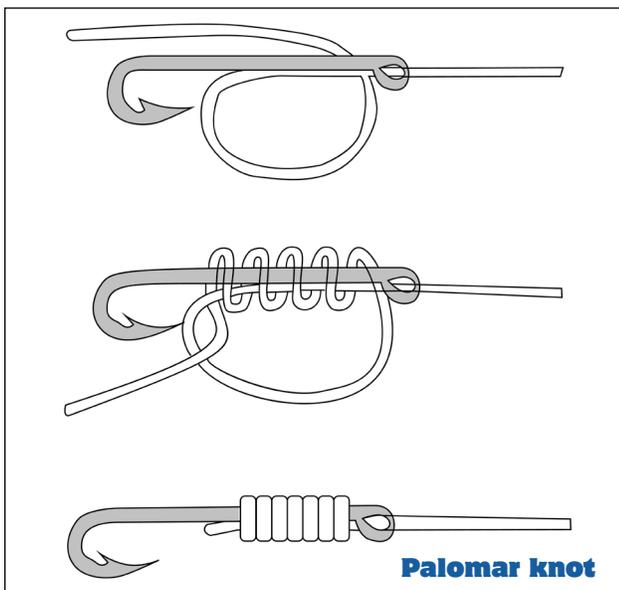


The **improved clinch knot** is a basic fishing knot that helps secure non-braided fishing line, such as monofilament line, directly to terminal tackle (tackle attached at the end of a line). This versatile knot retains most of its original line strength (upwards of 90 percent) and is a commonly used fishing knot.

The **double surgeon's loop** creates a loop at the end of the line that can be attached to other lines or lures. The loop gives attachments room to move freely. As with other loop knots, that free movement is beneficial because it reduces the impact of movement from the main line and makes attached hooks or lures less obvious to fish.

The **snell knot** allows you to tie the end of your fishing line or leader directly to any type of hook. Traditionally developed for eyeless hooks, this knot is still popular with all sorts of fishing tackle. The snell knot provides a strong attachment with a straight pull from the line to the hook shank and can be tied directly to the shank without passing through an eye.

The **palomar knot** is strong and durable. It can be used with monofilament, co-polymer, or braided lines. The palomar knot helps attach fishing line to various terminal tackle and retains almost 100 percent of the original line strength, making it a great choice for many anglers.



ACTIVITY

- Engage your learners by asking question such as:
 - » “Has anyone ever tied a knot?”
 - » “Does anyone know why we tie different types of knots?”
 - » “Why do we use knots in fishing?”
- Lead a group discussion about why different knots are important in fishing. For instance, you could mention that the type of line you use determines which knot is better for securing that line to a hook.
- Start reviewing the four knot types by first showing a copy of the instructions (from the Resources links) for each type of knot. Name each knot as you demonstrate tying it and explain what function that knot serves. Once reviewed, pass out para cord sections, eye bolts, and individual knot instruction guides to each participant.
- Have all participants work on the same knot, mimicking the step-by-step instructions as you lead the group in another demonstration. Work your way through the four knots, having the participants follow you step-by-step with their own para cord.
- Once all participants feel confident in tying all knots, divide them into two even teams. (If you have more than 10 participants, make three teams). These will be their relay teams! Make sure team members have their own, unknotted para cord.
- With the teams set, explain that each member of the team must have a correctly completed knot for it to count. Everybody will be tying knots at the same time, and the team that finishes their knots first wins the round. To start a round, randomly select one of the four knot types for the teams to tie.
- Play four rounds and a tie-breaker if time permits. After the activity, let participants keep their instruction guides.



EXTENSION/ENRICHMENT

Invite 4-H'ers who can tie the knots to help others during demonstrations.

ASSESSMENT

Test your learners' comprehension by asking the following questions:

- Which knots retain most of their original line strength when tied?

Improved clinch and palomar knots

- Which knot gives room for lures to move freely, making them less obvious to fish when in the water?

Double surgeon's loop knot

- When fishing, when would you want to use a snell knot?

If you want to attach the fishing line directly to the shaft of the hook.

RESOURCES

Knot Tying: Fishing Knots 101

<http://www.berkley-fishing.com/Berkley-ae-knot-tying-videos-instructions-on-how-to-tie-fishing-knots.html>

8 Fishing Knots to Know

<https://fishing.boyslife.org/8-fishing-knots-to-know/>

How to Tie Fishing Knots

<https://www.takemefishing.org/how-to-fish/how-tie-fishing-knots/>





Lesson 5: Casting

Casting is an essential part of fishing that allows you to get your fishing line out farther in the water. While there are different techniques and tools to help cast your line, basic casting can be performed with an aluminum can, fishing line, bait, and hook. Participants will learn how to effectively cast a line using affordable pieces of fishing equipment that are simple to use.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Demonstrate the essentials of basic casting.
- Practice accurate casting to a target.
- Enhance hand-eye coordination.

PREPARATION

Bring enough rinsed out aluminum soda cans for every participant to have one, including yourself. Have enough fishing line for everyone to be able to have about 30–40 feet each. Remember, this lesson is a simple, fun introduction to casting. Other lessons will go into details about types of reels and their purposes in casting, as well as how to tie tackle to the lines.

BACKGROUND

Casting is an important part of fishing, whether you are a beginner or professional angler. By accurately being able to get your bait or lure out into the water, you are more likely to attract various species of fish.

Methods to increase casting distance include using your body to transfer your weight to your rod as you are throwing your cast, using different rods and reels

designed to cast out to various distances, and even deciding which bait or lure to use based on how the added weight will affect the cast.

Practice is key! Regardless of the tools used, anglers must spend time learning their equipment and practicing to improve their overall casting accuracy.

Depending on the type of fish you want to catch, casting tools will vary. With fly-fishing, for instance, anglers use artificial flies attached to lightweight rods

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8–18

Safety Considerations

Have participants make sure areas in front of, overhead, and behind them are clear so that nobody will get injured by a casting plug.

Materials

- Empty aluminum soda cans
- Monofilament fishing line
- Practice plugs
- Tape
- Scissors
- Casting targets (rope, buckets, poster board, plastic rings, etc.)



and lines to help their cast mimic the movements of a real fly. On the other hand, heavier rods and reels are used in deep-sea fishing to help pull in the larger fish.

As we reviewed in Lesson 2, you can achieve different casting goals with different types of reels. Spin-cast reels are great for beginners, because the angler has control over when to stop the cast. Baitcast reels are designed for longer casts and may be difficult for beginners. Spinning reels are another option for longer casts.

Casting does not always require specialized equipment. In fact, you can use basic tools for casting. In many areas of the world, people fish using a handline. For this type of fishing, the angler holds the fishing line spooled in one hand, casts or throws the line out over water, and then pulls it back in by hand. This method of fishing is legal in some parts of the United States, but it is best to check local rules and regulations before using a handline on public waters.



ACTIVITY

- Engage your learners by asking questions such as:
 - » “How many of you think fishing equipment is expensive?”
 - » “Have any of you ever tried to cast a fishing line out over water?”
 - » “Does anyone think that fishing takes practice?”
- Discuss the basic elements of casting. Explain that casting equipment doesn’t have to be state-of-the-art or expensive to work appropriately by demonstrating the can casting technique.

- » Give each 4-H'er an aluminum can and start letting them wrap about 30 feet or so of fishing line around their can, being sure to secure the starting end to the can with tape or a tight knot. Once the line is wrapped, ask participants to tie their casting plugs to the free end of the line. Demonstrate a proper knot and help as needed.
- » Spread out participants in a line so they have clear space in front and behind them. Place practice targets in front of them (participants may share targets if there aren't enough) at about 10 feet to start.
- » Have participants grip their can without interfering with the fishing line. Allow the casting plug to hang down below the can (either from over the top or along the backside) about an inch or two. Now, let participants swing the can forward as if performing an underhand throw, being careful not to release the can in the process. The fishing line should extend forward.
- » Give participants a few throws to figure out the technique, encouraging them to try to cast as close to the targets as they can. If anyone struggles with this technique, they can try holding on to the plug and throwing it.
- Once everyone gets the hang of it, stop all casting. Tell everyone they have a limited number of casts (10 preferably, but fewer if time is short) and that they need to keep tally of how many times they hit the targets. After all casts are completed, have the participants self-evaluate how they did and how they worked on improving their casting. This activity isn't meant to be a competition, but rather an exercise to better hone their casting ability.

EXTENSION/ENRICHMENT

For 4-H'ers who need more of a challenge, you can start their targets back an extra 10 feet. If time allows, move everyone's targets back an additional 10 feet after the initial round and go through another round of casting at the greater distance.





ASSESSMENT

Test your learners' comprehension by asking the following questions:

- What is the casting technique that does not require the use of rods and reels?

Handlining

- Why would you want to get your bait or lure farther out over the water?

A far-reaching cast can help attract various species of fish.

RESOURCES

Pop Can Casting

<https://fyi.extension.wisc.edu/wi4hpublications/files/2015/10/Pop.pdf>

National 4-H Sportfishing Curriculum, “Can Casting” by Sharon Rushton





Chapter 2: Casting for More

Chapter 2 covers more advanced skills and knowledge you must acquire to become a more well-rounded angler. It provides basic information and activities associated with fish identification, fish habitat, water quality, and fishing on private waters. The specific lessons in this chapter include:

- LESSON 1: FISH IDENTIFICATION
- LESSON 2: STRUCTURE AND COVER (FISH HABITAT)
- LESSON 3: WATER QUALITY
- LESSON 4: FISHING PRIVATE WATERS



Lesson 1: Fish Identification

This lesson should be taught to all 4-H'ers so they will learn to identify the fish they catch. Tailor the information to fit your participants' ages and learning abilities. Other learners may want more information about each species and the difference between a sport fish and other fish found in Mississippi.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Identify species of Mississippi sport fish.
- Explain where these species are found in Mississippi.
- Identify bait fish and explain their role in the ecosystem.
- Explain the importance of clean water.

PREPARATION

Prepare a slide show of some of the common fish species anglers may encounter in Mississippi. Another option is to make flash cards of these species. A good source to start with is the Fish Identification Guide from the Mississippi Department of Wildlife, Fisheries, and Parks (see the Resources section).

BACKGROUND

Anglers will encounter a wide variety of species while out fishing. Some species are targeted more by anglers than others. Fish species that are most targeted by anglers are referred to as **sport fish**. Anglers should be able to identify not only the species they are targeting but also some of their target fish's forage, or what the fish consumes. Understanding the target species and its prey will increase your chances of a successful outing.

Many species inhabit the waters of Mississippi. It is crucial to be able to properly identify the various species of fish, as many of these species have a specific set of rules and regulations associated with recreational fishing. These include length restrictions, bag limits, and other regulations that help to protect the fish species.

Anglers should use appropriate tackle for their targeted fish species. Your understanding of the target fish species will influence your selection of baits.

Here are some varieties of Mississippi fish and some of the things they will eat:

The **sunfish family** includes largemouth bass, smallmouth bass, bluegill, white crappie, black crappie, and a variety of other species. These species are

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Safety Considerations

None

Materials

A computer or flashcards



in ecosystems ranging from riverine systems to lakes. These species are extremely popular for recreational and subsistence fishing. They eat everything from small grubs to other members of their family.

Catfish are a common fish targeted by anglers in Mississippi. The most popular catfish species in the state are channel, blue, and flathead. However, Mississippi is home to many others, including black, brown, and yellow bullheads. These species forage on a wide variety of items, but anglers commonly use small sunfish or chicken liver as bait.

Fish in the **Salmonidae family**, which includes salmon and trout, are commonly found in streams and riverine ecosystems. They are extremely popular with fly anglers. These species can eat a wide array of food items; anglers usually use small flies that mimic insects and minnows as bait. Mississippi stocks rainbow trout in a few lakes like Lamar Bruce for additional recreational opportunities.

Fish in the **pike family** include species like the chain pickerel, northern pike, and muskellunge. These fish are toothy predators that feed on small- to medium-sized fish. In Mississippi, we have the chain pickerel, which is the smallest of the three species.

Another toothy set of fishes are **walleye** and **sauger**. These species are sought after for their size and, in the case of the walleye, their tasty meat. Anglers commonly pursue these species by trolling, or driving a boat along while their lure follows behind in the water. You also can use spoons and a variety of other baits that simulate small minnows or other small prey items.

The bigmouth buffalo and the smallmouth buffalo are members of the **sucker family**. These fish can live extremely long lives and feed on larvae and other invertebrates. They are often caught using small flies, or they can be harvested in shallow water using archery equipment. These species live in rivers and streams across Mississippi.

ACTIVITY

- Engage your learners by asking questions such as:

- » “Have any of you caught fish from a river, pond, or stream?”
- » “Have you been to an aquarium to see fish?”
- » “Do any of you have a favorite fish species?”
- Show your fish species slide show or flash cards. Discuss the different species.
- Play Fish Bingo!
 - » Have your learners create a bingo card with all the different fish species they learned about. Provide copies of the blank bingo card on the next page.
 - » Call out descriptions of fish species for learners to complete their bingo cards.
 - » Have prizes for the winning players, such as candy or fishing lures.

EXTENSION/ENRICHMENT

Discuss other fish species from Mississippi’s freshwater ecosystems and the brackish water found on the Mississippi coast.

ASSESSMENT

Test your learners’ comprehension by asking these questions:

- Name four species of fish that can be targeted in Mississippi.
See the lesson for some examples.
- What ecosystems hold largemouth bass?
Ponds, lakes, and some riverine ecosystems
- What are some common bait fish?
Bluegill and minnows

RESOURCES

Mississippi Department of Wildlife, Fisheries, and Parks Fishing Education and Outreach page
<https://www.mdwfp.com/fishing-boating/education-outreach.aspx>

Click *Fish Identification Guide* in the left menu to download a pdf.



FISH BINGO





Lesson 2: Structure and Cover (Fish Habitat)

Recognizing where structure and cover might be in a waterbody can help make a good fishing experience a great one. Often, the terms *structure* and *cover* are interchanged, but this lesson will teach participants how to differentiate between the two and why structure and cover are important when fishing.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Describe structure in a waterbody.
- Describe cover in a waterbody.
- Explain how structure and cover are important to fish.

BACKGROUND

For a waterbody to be able to support a healthy fish population, it needs to include areas for fish to hide, eat, grow, move around, and spawn. Cover and structure are two resources that help accomplish those priorities by diversifying the water bottom and surrounding banks.

Structure includes permanent, irregular features that shape the bottom of a waterbody. Whether nat-

ural or constructed, structure includes variances in depth and changes in contour along the waterbody's floor. Humps (underwater islands where the waterbody bottom is higher than surrounding ground), channels (submerged riverbeds where the waterbody floor is lower than surrounding areas), and ridges (long, narrow humps alongside the edge of channels or creeks) are a few examples. These different structures can concentrate fish by providing ideal conditions during various times of the day or year. This can make some fish easier to catch if you are familiar with how they prefer to spawn, feed, and rest around structure.



Another key aspect of fish habitat is **cover**, or places for fish to hide. Smaller prey species use cover

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Safety Considerations

Check the area for ground holes, ant beds, and plants that might cause reactions (such as poison ivy).

Materials

None



to hide from predators. Larger fish can use cover to hide themselves before ambushing unsuspecting prey. Forms of cover include trees, shrubs, grass, and constructed fish cover made from concrete blocks, culverts, or wooden pallets. Well-placed cover in shallow water (8 feet or less) or near a drop-off to deeper water helps provide escape routes for fish and can also foster the growth of invertebrates for smaller fish to eat. Cooler waters are also found under cover, and some fish species like to gather in this cooler water. A healthy habitat doesn't need much cover but should have at least a few options for the fish to maneuver around.

Structure and cover give smaller fish the opportunity to take shelter, escape from predators, and continue growing. As an angler, you can use your knowledge of how fish use structure and cover to your advantage. For example, by fishing parallel to structures and cover, you can often lure fish out into open water. Also, when fishing near or around cover, it's best to use a weedless lure, or one with a protective guard over the hook to keep it from getting stuck in the nearby vegetation. The more you familiarize yourself with the structure and cover patterns of the waters you're fishing, the more likely you are to hook a fish.



Photo credit: USFWS digital library

ACTIVITY

- Engage your learners by asking questions such as:
 - » “Has anyone ever seen a lake or pond being built?”

- » “How many of you think that trees and shrubs along the banks just get in the way of fishing?”
- » “Has anyone caught or seen someone catch a big fish under trees along the bank?”

- Explain what structure and cover are and why they play an important role in fishing.
- After reviewing the concepts, ask for two volunteers to act as the “fish” in the upcoming scenarios. With the remaining participants, start by lining six of them up in two rows, back-to-back, but with about 3 feet of space between their backs. Have them raise their arms up to a 45-degree angle to represent a creek channel on the bottom of a lake. Have the two volunteer “fish” begin moving up and down the gap area between backs, demonstrating how fish will use the deeper waters in a channel to move around and sometimes avoid being eaten in the shallow waters.
- Next, have all participants (except the volunteer “fish”) get in a circle and hold hands. Tell them they just formed a structure called a hump, or an underwater island. Move the volunteer “fish” around the outside of the circle, indicating that fish sometimes like to rest and relax off these humps between feeding around the structure.
- For the final scenario, have half of the participants form a semicircle around the two volunteer “fish,” raising their arms out in front of them to mimic tree limbs hanging over the water. They're representing cover. Let the volunteer “fish” move under the cover freely and explain how smaller fish can use the protected waters as hiding spaces from larger fish.

EXTENSION/ENRICHMENT

For older 4-H'ers, choose another volunteer to act as a predator species. Review the scenarios from the perspective of a larger fish. For example, instead of trying to hide in cover, have the “predator” move around cover as if looking for smaller fish to eat.



ASSESSMENT

Test your learners' comprehension by asking the following questions:

- What are three types of structures used by fish?

Humps, channels, and ridges

- What are some things used to create cover in a waterbody?

Trees, shrubs, grass, and constructed fish attractants

- Why is using a weedless lure beneficial when fishing near cover?

Weedless lures have protective guards over the hook to keep them from getting stuck in nearby vegetation.

RESOURCES

What's the Difference between Structure and Cover?

https://www.bassresource.com/fish_biology/structure-cover-difference.html

How to Fish Structure 101 (video)

<https://1source.basspro.com/index.php/component/k2/237-fishing-info/1544-how-to-fish-structure-101>





Lesson 3: Water Quality

Healthy water is a necessity for almost all organisms to survive, including humans and fish species. Water quality is a good gauge of how healthy a waterbody is. This lesson will teach 4-H'ers why healthy water is important and how certain activities affect water quality.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Explain how rainwater runoff affects water quality.
- Describe how conservation practices can help improve water quality.
- Recall how water temperature affects aquatic species.
- Explain the importance of clean water in habitats.

PREPARATION

Using scissors, cut a 2-liter plastic bottle lengthwise from just below the collar of the bottle to about 2 inches from the bottom. Make a second cut parallel to the first about 4 inches away. These cuts will form the long sides of a rectangular piece of plastic that will be removed from the bottle to make a trough. To complete the trough, cut from the start of one long incision across the curve of the bottle to the start of the other long incision. Repeat this process at the other end of the long incisions. Remove the curved, rectangular piece from the bottle (see photos). Repeat this process for the remaining two bottles.

Number each bottle and its corresponding plastic cup. Cut small notches in the long side of the aluminum tray to accommodate the bottle tops. Place the three bottles on their sides in the tray with the open trough-side up, and fill each bottle about half full of soil. After the soil is in place, sprinkle the wood chips, hay, or pine straw on top of the soil of one

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Safety Considerations

Have gloves/hand sanitizer available for anyone who will directly handle the topsoil or turf.

Materials

- 3 clear 2-liter bottles
- Scissors
- Aluminum tray large enough to hold bottles on their sides
- Topsoil
- Small sample of wood chips, hay, or pine straw (approximately 2 to 3 cups)
- 1 piece of sod with grass (about 4-by-8 inches)
- 3 clear plastic cups
- Water





bottle. Place the sod on top of the soil in the second bottle. The third bottle will contain only soil.

Note: If time is available and learners are about 12 years or older, the simulator can be constructed as part of the exercise. If time is limited or learners are young, construct the simulator in advance. Note that the plants in the sod will not be able to survive very long in open air; however, it is important for the experiment to make sure all three bottles are treated the same. So, if it becomes necessary to water the

plants, apply the same amount of water in the same manner to all three bottles.

BACKGROUND

Water quality is the physical, chemical, biological, and radiological characteristics of water. In an aquatic ecosystem, good water quality is essential for fish as well as macroinvertebrate populations. Clean water provides organisms a better opportunity to grow and reproduce, which leads to healthy adult fish populations up the food chain. In a healthy body of water, macroinvertebrates, such as dragonfly larvae, grow and become food for smaller fish, which in turn become prey for larger fish. All species of wildlife (and even humans!) rely on clean water to survive, which means that healthy aquatic ecosystems are beneficial to all species across the world.

In poor-quality water, heavy loads of sediment in streams can bury fish eggs and eventually suffocate them. One way to prevent loose sediment from entering waterways is planting rooted vegetation along creek edges. Vegetation growing near a river, stream, or creek is called a **riparian buffer** and can help keep topsoil in place during heavy rain events. Leaves from riparian trees also help slow down raindrops before they impact the soil, further protecting the area from loss of topsoil.

Riparian buffers often are implemented and maintained by landowners to improve water quality downstream. They can help filter out **runoff pollutants** such as excess fertilizer from a nearby farm or even vehicle gasoline from a parking lot. This runoff pollution is also called **non-point source pollution** because contaminants wash away from a large area. Runoff pollution is detrimental to water health because it can kill food sources for aquatic animals and make the waterways uninhabitable by some species.

Aside from keeping soil on the ground, vegetation such as trees and shrubs helps keep waterbodies shaded and cool. Fish rely on cooler water during the warmer parts of the year because it cools them off and holds more dissolved oxygen for the fish to use. The shade also can make fishing during the summer months more enjoyable.





ACTIVITY

- Engage your learners by asking questions such as:
 - » “How many of you have seen muddy water running off of a field?”
 - » “Have any of you seen a muddy creek or river after a heavy rainstorm?”
 - » “Has anyone ever heard of run-off pollution?”
 - » “How do you know water is clean?”
- Lead a discussion on why water quality matters to wildlife, mentioning the different conservation practices to increase water quality and how water temperature can affect quality.
- Demonstrate runoff pollution.
 - » Explain to students that the three bottles represent three different land uses: a bare field, a crop field with litter, and a pasture or lawn with grass cover.
 - » Ask students to predict what might happen when rain falls on these land use types. Write down their predictions for each bottle.
 - » Have someone hold the tray containing the bottles of soil off the table or set it on a small stand. Place clear cups below the bottle spouts to catch “runoff.”
 - » Pour the same amount of water onto each “land use.” Explain that excess water that does not soak into the soil is called “run-off.” Ask the students to note the differences in the water among the three capture cups. Were predictions correct or inaccurate? Why?
 - » Remind the students that more runoff occurs in areas with concrete, paved roads, or other hard surfaces, and much less in areas covered with vegetation.
 - » Explain that animal waste from livestock and pets, as well as roadside litter, oil, pesticides, and other chemicals can be carried in runoff, leading to polluted waterbodies.

EXTENSION/ENRICHMENT

If you have more time and available financial resources, consider purchasing a water test kit for your students to investigate the quality of water in your area.

ASSESSMENT

Test your learners’ comprehension by asking the following questions:

- What is pollution that occurs from a widely contaminated source called?
Non-point source pollution
- What is the name for vegetation growing near a river, stream, or creek?
Riparian buffer
- What do you call the physical, chemical, biological, and radiological characteristics of water?
Water quality

RESOURCES

MSU Extension Publication 3423 Water Science and Stewardship

<http://extension.msstate.edu/publications/water-science-and-stewardship>

How Does Water Pollution Affect Fish?

<https://sciencing.com/water-pollution-affect-fish-4565696.html>

Adopt-A-Stream Mississippi

<https://mswildlife.org/adopt-a-stream>

Mississippi Soil and Water Conservation Commission District Directory

<https://www.mswcc.ms.gov/district-directory>





Lesson 4: Fishing Private Waters

When fishing private waters, always get permission from the landowner to avoid trespassing. Asking for permission to be on someone else's property displays integrity and responsibility in an angler. This lesson will teach 4-H'ers why it is important to ask for permission to fish private lakes and how to behave as a guest on someone else's property.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Explain how to properly ask permission to fish private property.
- Define and explain the consequences of trespassing.
- Explain how to behave when on private property.

PREPARATION

Ask a few local private lake owners if they are willing to come to the lesson to help participants practice asking for permission to fish on their lake. If unable to come, see if the landowner is available to phone into the lesson instead. If nobody is available, then act as a landowner during the activity portion.

BACKGROUND

Trespassing is defined as being on someone else's property without their consent (permission). Consequences for trespassing vary by state. In Mississippi, trespassers can be fined, or jailed depending on the situation. If caught attempting to fish on private waters without the owner's permission, you could get your fishing privileges taken away. It is possible that some landowners might shoot at trespassers on their property, so asking permission from the start is critical.

It is best to get permission from a landowner face-to-face so they can learn more about you and meet you in person instead of just talking over the phone. Manners go a long way; after introducing yourself, it is sometimes helpful to explain why you want to fish their lake. If permission is granted, ask if there are any special rules for fishing their property. Here are some questions you might want to ask:

- Are there fishing limits?
- Can I keep the fish I catch?
- Would the landowner like a portion of anything I catch?

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Safety Considerations

None

Materials

None



Make plans to obey all the rules outlined to you. You might want to ask for a permission note to carry with you when you are on the landowner's property. Be sure to follow up with a thank you call or note after you leave, remembering that the landowner is doing you a favor by allowing you to fish their property. If the owner denies your request to fish, kindly thank them for their time and politely leave the property.

When you visit private property to fish, treat the area as you would your own property. Never leave trash behind. This is rude, and you can be arrested, fined, or potentially jailed for littering. Always leave gates the way you found them unless instructed otherwise by the landowner. Never intentionally cause damage to private property. If damage does occur, immediately report it to the landowner. As you are able, offer to help fix the damage.

Never invite someone else to fish private property with you unless they also have permission to be there. Remember, the landowner decides who they let onto their property. Just because you have permission doesn't mean your friends do, too.

When fishing a private lake, remember that you are a guest and, if you are respectful, you will likely keep being able to fish on that property.

ACTIVITY

- Start by introducing your guest landowners to the group.
- Follow by asking participants questions such as:
 - » "How many of you have ever fished on private property?"
 - » "Have any of you have ever asked permission to fish?"
 - » "Does anyone know what the consequences of trespassing are?"
- With input from private landowners, lead a discussion on why asking permission to fish private land is important and explain the potential consequences of being on private property without permission.

- Have the landowners sit/stand in front of participants. One by one, have participants practice communicating with a private lake owner by politely asking permission to fish their lake.
- Encourage the landowner to describe the rules for fishing their property, expectations about how to treat the property, and the consequences if the rules are not followed.

EXTENSION/ENRICHMENT

If any 4-H'ers have had to ask permission before from a landowner, ask if they'd be willing to share their experiences with the group.

ASSESSMENT

Test your learners' comprehension by asking the following questions:

- What is it called to be on someone else's property without their permission?
Trespassing
- What are some consequences of trespassing in Mississippi?
Being arrested, fined, or jailed
- What are three additional questions to ask a landowner once they have given you permission to fish their lake?
Are there special rules for fishing your lake?
Are there fishing limits?
Can I keep the fish I catch?
Would you like a portion of anything I catch?

RESOURCES

Handling Trespassers

<https://www.naturalresources.msstate.edu/business-resources/manage/trespassers.php>

How to Get Permission to Fish Private Ponds

<https://www.wired2fish.com/bank-fishing/how-to-get-permission-to-fish-private-ponds/>







Chapter 3: Hooked on Sportfishing

Chapter 3 provides skills and knowledge for those who show the greatest interest in fishing and show the ambition to become lifelong anglers. It will provide basic information and activities associated with first aid, GPS/navigation, snake identification, and preparing fish for the table. The specific lessons in this chapter include:

- LESSON 1: FIRST AID
- LESSON 2: GLOBAL POSITIONING SYSTEMS
- LESSON 3: SNAKE IDENTIFICATION
- LESSON 4: POND TO PLATE



Lesson 1: First Aid

Knowing how to administer basic first aid can prevent minor cuts, bites, or stings from becoming serious injuries. This lesson reviews how to handle common injuries that can occur while fishing. It's important for all 4-H'ers to review this lesson—the youngest member of a fishing party might be the person who must give aid in the event of an injury.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Explain the process for removing a hook from their body.
- Demonstrate how to care for bee stings and snake bites.
- Explain how to care for a minor cut.
- Describe how to avoid sunburn.

PREPARATION

Reach out to nearby allied health clubs to see if you can find someone to instruct 4-H'ers on how to treat minor cuts with fake wound displays. If not, see the Resources section for a link to a how-to video on caring for minor cuts.

BACKGROUND

Knowing how to perform first aid is a useful tool for all outdoorsmen and women to have, as first aid helps minimize injuries. When giving first aid, one of the most important aspects is to stay calm. Not every situation is the same, but every situation is more manageable if everyone remains calm. A helpful tool to bring with you on every fishing trip is a well-stocked first aid kit that includes supplies such as bandages, antibiotic ointment, some sort of protective cloth or wrap, scissors, an EpiPen (if necessary), and sunscreen.

Because of some of the dangers of fishing, it is best to never fish alone. Fish with people you or your parents trust to take you to the hospital in case of an emergency.

SUN PROTECTION

One of the easiest ways to protect your skin from injuries while fishing is to wear protective gear and

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Safety Considerations

The instructor should handle all hooks and pliers during the demonstrations to prevent injuries.

Materials

- 1-inch sections of foam pipe insulation (large enough diameter to put over participants' arms)
- No. 3 fishhooks
- Side-cutting pliers
- Red marker/pen
- Small ice packs or baggies with ice
- Small first aid kit, stocked



water, checking to see if there is any fish bone left in the wound. If there is bone in the wound, take a pair of sterilized tweezers and remove the fragment. If it is too deep, go to a hospital to have it removed. With puncture wounds, tetanus can occur, so consult a physician about a tetanus booster.

ACTIVITY

- Engage participants by asking questions such as:
 - » “Do any of you know someone who has been stung by a bee or bitten by a snake?”
 - » “Has anyone here accidentally had a fishing hook stuck in their skin?”
 - » “Does anyone wear sunscreen while outdoors?”
- Discuss the basics of first aid. Demonstrate how to deal with minor cuts, snake bites or bee stings, and removing a fishhook from skin.
- If an allied health club is available, let them show 4-H’ers how to treat minor cuts and scrapes with their displays. If not, use supplies from the first aid kit to demonstrate how to treat a minor cut, following advice from the instructional video linked below.
- For the next demonstration, ask for a volunteer and place a section of foam pipe insulation around their forearm. Hook a No. 3 fishhook into the foam, but be careful not to go too deep! Push the hook back through the foam until the barb is exposed. Using side-cutting pliers, cut the barb off and push the hook back through and out of the foam. Repeat this demonstration as needed so that different participants can volunteer and see how to remove a hook.
- Ask for another volunteer, checking to see if they’re OK with being marked on with red ink. To imitate a bee sting, mark a dot or small “x” with red ink on the volunteer’s arm. Instruct another 4-H’er to grab some small ice packs or a baggie and fill it with ice from the cooler. Place the ice on the bite location and discuss

what additional steps would need to be done if the person is allergic to bee venom.

- To imitate a snake bite, mark two bite marks on a volunteer’s arm and repeat the process of having someone quickly bring over ice. Be sure to keep the bite area lower than the victim’s heart. Remind 4-H’ers to seek help immediately after a snake bite so that proper medical care can be given by professionals, especially if the snake was identified as a venomous snake.

EXTENSION/ENRICHMENT

Depending on time and availability of supplies, allow 4-H’ers to practice tending minor cuts on each other so that they can get comfortable with using the supplies in a first aid kit.

ASSESSMENT

Test your learners’ comprehension by asking the following questions:

- What are some supplies to keep in a first aid kit?
Bandages, antibiotic ointment, some sort of protective cloth or wrap, scissors, an EpiPen if necessary, and sunscreen
- Sunscreen helps protect your skin from developing which type of skin cancer?
Melanoma
- What first aid tool is administered to a victim of a bee sting that is experiencing anaphylactic shock?
EpiPen

RESOURCES

How to Treat Cuts and Scrapes (video)

<https://www.youtube.com/watch?v=L77rERL64zc>

First-Aid Kits: Stock Supplies that Can Save Lives

<https://www.mayoclinic.org/first-aid/first-aid-kits/basics/art-20056673>







Lesson 2: Global Positioning Systems

Good fishing spots are often in areas that are difficult to find or access. Anglers can use a Global Positioning System (GPS) to help them navigate back and forth between these hard-to-reach locations. This lesson will give 4-H'ers information about GPS and some other tools that can be used with GPS.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Explain the Global Positioning System.
- Download smartphone GPS applications.
- Define coordinates.
- Use coordinates to navigate to a location.

PREPARATION

Obtain a map and compass, and have access to a computer or phone that can use Google Maps.

BACKGROUND

Global positioning systems allow people to travel the world and locate where they are to reduce their chances of getting lost. This technology was originally developed for the military. These systems work by

triangulating your location using 28 satellites that orbit Earth. You can download an app that turns your smartphone into a GPS, or you can use a handheld GPS unit.



GPS coordinates are based on latitude and longitude. These invisible lines that stretch around the globe determine the coordinates, allowing you to locate towns, buildings, highways, and other objects on a landscape. Latitude lines run horizontally and determine how far north or south a location is. Longitude lines run vertically and determine how far east or west a location is.

While the GPS has advanced substantially over time, it does not eliminate the need for a map and compass. Knowing how to navigate using a map and compass will be critical if you are ever in a situation without a working GPS device.

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Safety Considerations

None

Materials

- Map
- Compass
- Cell phone



ACTIVITY

- Engage learners by asking questions such as:
 - » “How many of you have used a map or compass to navigate?”
 - » “How many of you have used a GPS unit or smartphone app to navigate?”
 - » “How many of you use Google Maps?”
 - » “How many of you have a navigation system in your family car?”
- Have learners search for a proposed lake on Google Maps and tap on a landmark at the lake (a fence post, tree, etc.).
- When you tap the landmark, you will get a set of coordinates. Set your phone to navigate to the location, or plug the coordinates into a GPS device.



EXTENSION/ENRICHMENT

Have 4-H'ers get close to the dropped location, and then have them navigate the rest of the way with a map of the area and a compass. See the Resources for a link to learn about using a compass.

ASSESSMENT

Test your learners' comprehension by asking the following questions

- What does GPS stand for?
Global Positioning System
- What is a coordinate and how is it derived?
A set of numbers that comes from the longitude and latitude lines.

RESOURCES

How to Use a Compass

<https://www.rei.com/learn/expert-advice/navigation-basics.html>



Lesson 3: Snake Identification

While anglers are out enjoying the great outdoors, they may encounter snakes. In this lesson, 4-H'ers will learn how to identify the different snakes and how to best react when they encounter one.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Identify species of Mississippi snakes.
- Explain where these species are found in Mississippi.
- Explain what to do if you encounter a snake.

PREPARATION

Create a slide show about the different species of snakes in Mississippi. See the Resources section for help.

BACKGROUND

Ecosystems support a wide variety of species, ranging from the white-tailed deer to common ants. Within the ecosystems that include fish, snakes can also be found. These are cold-blooded reptiles that can feed on a variety of prey items such as small mammals and even fish. Anglers may encounter

these reptiles while fishing from the bank or a boat. Most snakes will slither away before you get too close, but if the snake feels trapped, it will defend itself.

It is important to be able to identify snakes in case someone is bitten. If the snake is venomous, the hospital can give the correct anti-venom. There are approximately 50 species of snakes in Mississippi. Only six of these species are venomous: copperhead, cottonmouth, timber rattlesnake, eastern diamond-back rattlesnake, eastern coral snake, and pygmy rattlesnake.

You can learn to distinguish most venomous from non-venomous species by their head shape and pattern. Five of the six venomous species belong to the pit viper family. They have venom sacks at the back of their skulls and pits in the front of their faces. They have triangle-shaped heads. The eastern coral snake is in the front-fanged venomous family. It does not have a triangle-shaped head, so you can use this rhyme to identify it: “red touches black, it’s okay Jack; red touches yellow, you’re a dead fellow.”

It’s always best to give snakes plenty of space. This way you can admire the beauty of the species while reducing the chance of harm to yourself and the snake.

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Safety Considerations

None

Materials

Computer to display website

ACTIVITY

- Begin the conversation by asking your learners:
 - » “Have any of you ever seen a snake?”
 - » “Did you know what kind of snake it was?”
 - » “Why do you think snakes live near water?”
- Go through your slide show and talk through the different species of snakes found in Mississippi.

EXTENSION/ENRICHMENT

Those 4-H’ers who excel or take special interest in snake identification may be interested in materials that provide a more in-depth knowledge of snakes.

ASSESSMENT

- How many venomous species are in the state of Mississippi?
Six
- What is the best practice when encountering a snake?

Give the snake plenty of space and admire from a distance.

RESOURCES

Venomous Snakes of Mississippi

<https://www.mdwfp.com/media/news/education-outreach/venomous-snakes-of-mississippi/>

MSU Extension Publication 3529

Snakes Alive! How to Identify Hazardous Snakes

<http://extension.msstate.edu/publications/snakes-alive-how-identify-hazardous-snakes>





Lesson 4: Pond to Plate

The earliest people fished to provide food for themselves and their families. Today, many people still enjoy catching fish for a tasty meal from the natural world. In this lesson, 4-H'ers will prepare fish to be cooked and create a delicious fish meal.

LEARNING OBJECTIVES

After completing this lesson, participants should be able to:

- Demonstrate proper handwashing technique.
- Handle raw fish in a safe and sanitary manner.
- Prepare raw fish for cooking.
- Demonstrate different ways of cooking fish.
- Serve cooked fish in a visually appealing manner.

PREPARATION

Gather the necessary materials to prepare the fish recipe of your choice or one of the examples in the Resources section. Bring fish for 4-H'ers to clean and cook.

BACKGROUND

Cooking fish that you caught can be a rewarding experience, but there are a few things anglers need to do before the fish hits the plate. First, make sure that your hands are clean before cutting into your fish. See the Resources section for a proper handwashing link. Germs can live on our hands, uncooked fish, and cooking surfaces. These microorganisms can make us sick when they enter our bodies. Sickness from these germs is preventable if we clean our hands, fish, and cooking surfaces before the cooking process begins.

There are many ways to cut fish for cooking. To keep this lesson simple, we are going to focus on the fillet cut. For learners who are interested in other fish cuts, see the Resources section. A fillet is one continuous cut of fish that runs from the pectoral fin to the caudal (tail) fin. Running a fillet knife along the spine of the fish will guide you and keep the cut even. Once you have cut to the base of the tail, flip

Ages

8–18

Safety Considerations

Youth will be handling knives, so direct supervision is needed.

Materials

- Fillet knife
- Cooking utensils
- Pots/pans
- Fish
- Vegetables
- Any other ingredients needed for your recipe
- First aid kit





the fillet over to separate skin and meat. See the Resources section for a step-by-step guide to cleaning and filleting fish.

People have different preferences for how to prepare fish, including frying, baking, and grilling. Baking fish is a healthier option than deep-frying it. Grilling fish over charcoal or wood can add different flavors to fish. See the Resources section for recipes to try.

ACTIVITY

- Engage your 4-H'ers by asking questions such as:
 - » “How many of you enjoy eating fish?”
 - » “What is your favorite type of fish to eat?”
 - » “How do you like your fish cooked?”
- Demonstrate filleting a fish while your listeners watch. Remember to describe what you are doing and the safety considerations you are taking while cutting.
- With supervision, watch the learners cut their fish, and advise them on how to get the most meat.
- Split your group in half and have one group try the Cajun catfish recipe and the other try the fried catfish recipe.
- Plate both recipes and enjoy while discussing other techniques for cooking fish.

EXTENSION/ENRICHMENT

Have students who are interested in other cooking methods find a recipe and prepare it for the group.

ASSESSMENT

Test your learners' comprehension by asking the following questions:

- What is the proper way to wash your hands?
Wet your hands with warm, running water. Apply soap. Rub your hands together for at least 20 seconds. Clean under your fingernails and between your fingers. Rinse your hands thoroughly under running water. Dry your hands, and throw the paper towel in a trash can.
- What should you do with your fish before cooking?
Wash them in cold water
- What knife is best for filleting a fish?
Fillet knife
- Name three ways to cook fish.
Grill, bake, and fry (deep or pan)

RESOURCES

A Correct Handwashing Procedure

<http://extension.msstate.edu/publications/miscellaneous/tummysafe-correct-hand-washing-procedure>

Types of Fish Cuts We Commonly See

<https://wrytin.com/chenyamishra/types-of-fish-cuts-we-commonly-see-jv9tdbu6>

How to Fillet a Fish

<https://www.takemefishing.org/how-to-fish/how-to-catch-fish/how-to-fillet-a-fish/>

Jack's Fried Catfish (recipe)

<http://www.myrecipes.com/recipe/jacks-fried-catfish>

Cajun Baked Catfish (recipe)

<http://www.tasteofhome.com/recipes/cajun-baked-catfish>



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