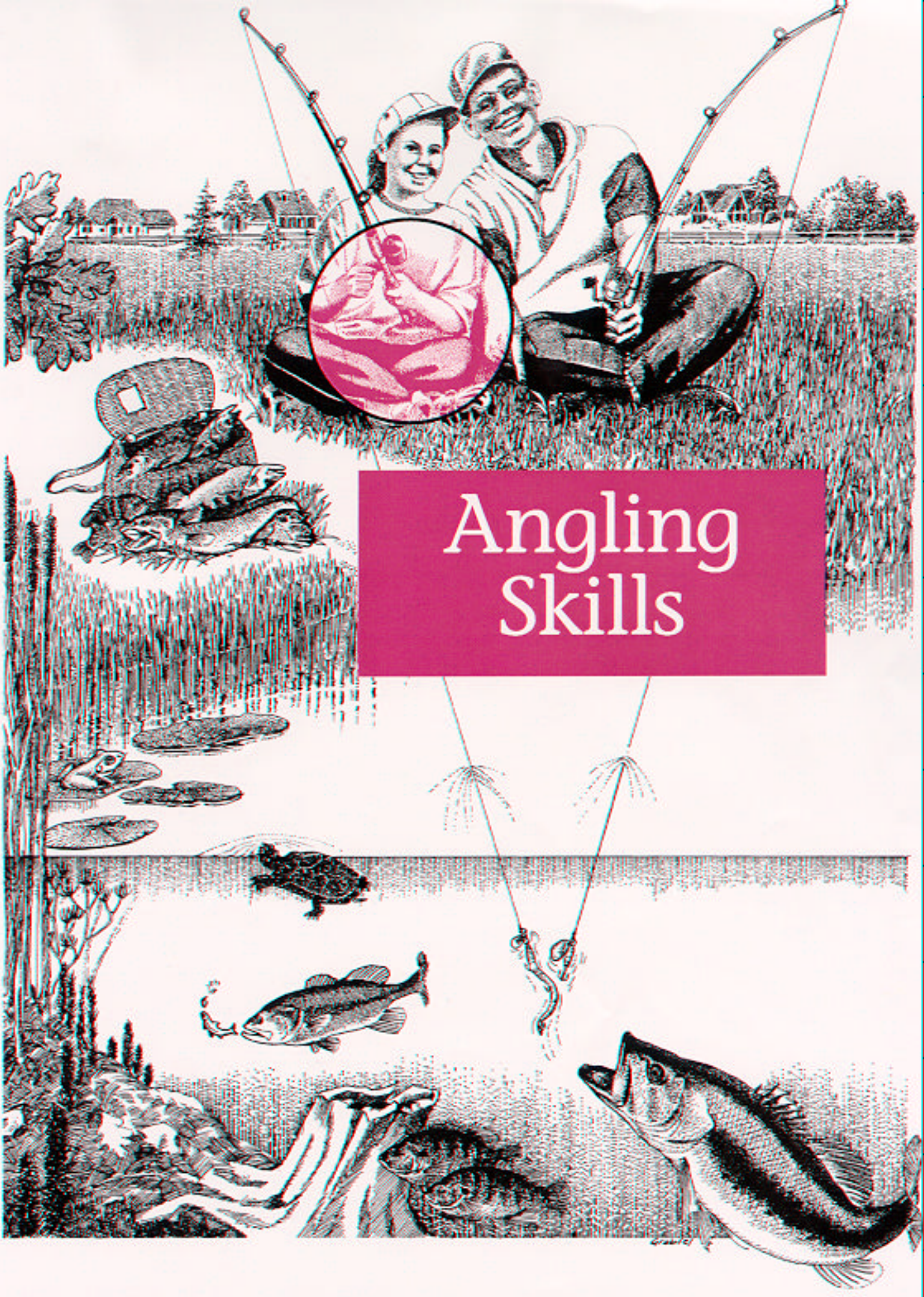
Appendix B

Sample Curriculum Materials



Angling Skills

You "Can" Cast

Timing
Anytime, as a first casting lesson.

Duration
About 15 to 30 minutes, but can be expanded if participants are interested.

Location
Anywhere, indoors or out, where 10 to 20 feet of open area is available.

Life Skills
Gross and fine motor skills, hand-eye coordination, goal-setting, planning/organizing, self-concept, self-esteem, problem-solving, learning to learn.

OBJECTIVES

Participating will be able to:

- Practice essentials of casting.
- Make and use inexpensive fishing equipment.
- Learn how line goes on and off of a fishing reel spool.
- Practice casting using the "can technique."
- Practice accurate and precise casting to a target.
- Have fun while learning.

Age/Stage
Fry, fingerling, young adult.

Across the Curriculum
Physical Education.

Correlations
Physical Education:

Background
Before lecturing on the different kinds of fishing reels and their applications, begin with a hands-on exercise of can casting. This will open the participants' minds to the fun and challenge that casting offers.

In many areas of the world, people do not have access to rods and reels. They fish using a hand line, where line is spooled in the hand and the line is cast by tossing the hook/bait out into the water. Once a fish is on the line, they just pull the line in with their hands. Can casting is a similar technique, and a few people in the U.S. actually use this technique to fish. Michigan allows can casting rigs to be used for fishing—but be sure to double-check the state regulations, as these change from year to year.

Many people have the misconception that fishing requires expensive equipment. The can casting technique demonstrates that fishing can be accomplished for less than a dollar: ten cents from an aluminum pop can, a few cents for fishing line (or free from the recycle bin at the local sporting goods store), a few cents for a hook, and bait such as worms can be caught at no expense. Throw on a cork for a float and metal washer, nut, or bolt for weight, and you are fishing! It is amazing what anglers will come up with to catch a few tasty worm-biters.

Aluminum cans work in a similar way to a spinning or spincasting reel in that the line is pulled off of a stationary spool by the lure or bait, or weight. In this activity, the participants will learn how the line goes on and off of a reel and about proper thumb or finger release and arm motion needed to use the spin

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casting and spinning rod/reel combinations.

Materials

- Aluminum pop cans
- Monofilament line (8–10 pound test)
- Practice casting plugs (if not available, large rubber erasers will do)
- Casting targets—poster board, rope or tape circles, buckets, wastebaskets, hula hoops
- Tape (duct tape works best)
- Safety glasses—one for each person casting
- Something to mark a casting line on the ground—flagging tape, rope, chalk, or flour
- "Back Yard Bass" game (optional)

Procedure

1. If this is your first time to see participants, bring enough empty washed out aluminum soda cans for everyone. If you have had participants in a prior lesson, ask each one to bring their own can. This shows them how items can be reused and allows them to build their own can casting outfit to take with them.

2. This activity is intended to be fun and uncomplicated. Do not try to sneak in all the information you have in your head about tying knots, appropriate ways to stand, etc. This will come later. Have students attach fishing line to their can by tying it to the tab on the top. They can do this by tying any kind of knot or even using tape. Once attached, have them wind the line around the can using just a little more line than the maximum length to be able to cast in the situation. (This is usually about 10 to 12 feet or three full double arm lengths pulled from one hand to the other across their chest.)

3. Demonstrate how to tie the casting plug to the line. You can demonstrate one method of tying a knot, but basically you need to be concerned only that the plug is on well enough that it is not cast off the end of the line. Each participant should have his or her own can-casting outfit. If this is not possible, groups of three or four will work well.

4. It is a good idea for the casting practice to be done in a casting area, with a casting line drawn or placed on the ground, that is not to be crossed. This can be done with flagging tape, rope, or a chalk line. This casting line will prevent participants from moving in front of other casters. If anyone has a casting plug stuck in the casting area, the instructor should be contacted to help out. This will help keep your casting area safe.

5. Now that the can casting outfits are ready to go, it is time to cast. Demonstrate how to hold the can by grasping it in your hand behind the line. A finger or a thumb can be used to stop the line from coming off the can or letting it loosen or unwind. Using your thumb will simulate using the button on a spin-cast reel, which acts as a release and break for the line coming off of the spool. Using your finger will simulate a spinning-reel procedure. ***Be sure the participants do not have their hand covering the line, because that will stop the line from unwinding. (This is a very common mistake.)*** Allow the plug to hang freely an inch or two below the can.

6. Demonstrate the motion that you would use to throw a ball underhand, and let the line spool off the end of the can while you continue to hold onto the can. Set out large targets (see Materials) and pass out safety glasses to all who are going to cast. Participants should always have a target to shoot for, even though many may not use it in the beginning. Targets should be close and large at first; success is important for the participant! Once the participants gain some experience, target size can be changed and targets can be moved farther out.

7. There are different techniques for casting, and you can let the participants experiment. One technique is to hold the plug in the other hand and throw the plug out. Through practice and changing strength of throw, try to hit different targets. If you are in a classroom, you may have to limit the number of people who cast at one time. If you are outside, everyone can cast at the same time. Make sure that participants are not in the "line of fire." You do not want anyone to get hit in the eye with a casting plug!

8. Encourage participants to come as close to the targets as possible. Once they get the hang of it, have everyone stop casting. Tell everyone they have 10 casts and to count how many targets they hit. The 10 casts are not intended to be competition, but a self-evaluation. You do not need to have students announce their scores.

9. Have each participant try using their thumb and also their finger because they may be learning both spin casting and spinning activities through Project F.I.S.H.

Adaptations

Have the participants invent a few games involving can casting. A list of suggested games is included in "Spin Casting Basics." Try a few of these once the creativity has waned.

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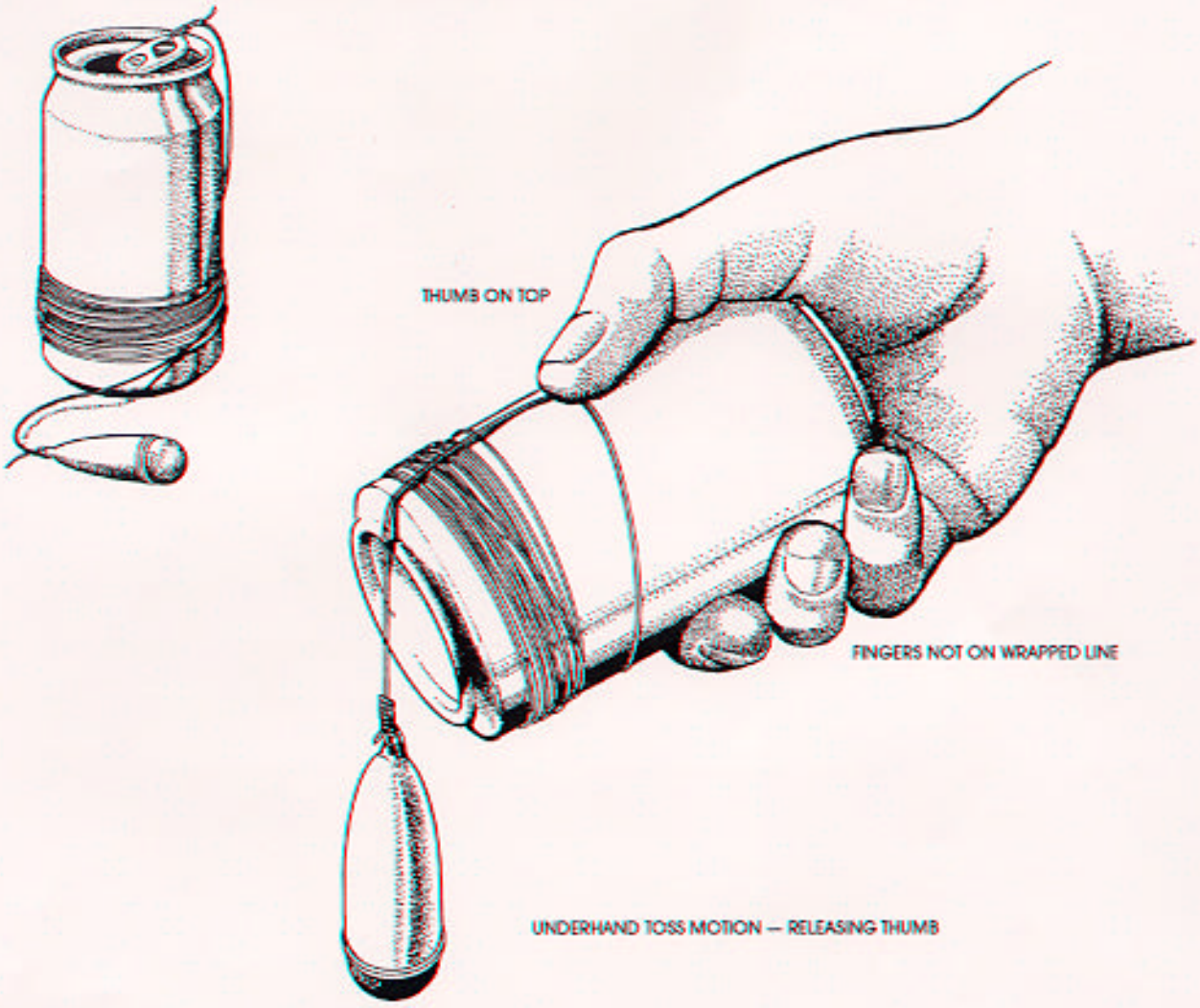

Tips for Success

- Be sure that participants are clear of any casting lane so that they are not hit, particularly in the eye, with a casting plug (glasses should be worn).
- Announce casting line and safety guidelines (e.g., no one crosses the casting line; if your plug is caught downrange, raise your hand for the instructor).
- Place a piece of duct tape over the can opening, as these can be sharp.

Extensions/ Additional Resources

- Have participants design their own casting targets, from cardboard, markers, construction paper, etc.
- Research other uses for recycled pop cans and fishing line.
- Have participants research and explain the history of the Michigan 10-cent pop refund.

Community Service

Have can casting at a local event or have a fundraiser for a local organization: Can Cast-a-thon!

Exhibits/Sharing

Have participants teach someone else how to can cast (younger clubs, friends, parents, etc.).

Career Opportunities

Fishing instructor, reel manufacturing engineer, physical education teacher.

Source

Adapted by Mary Riley, MSU 4-H Youth Development Programs, from the National 4-H Sportfishing Curriculum. Developed by Sharon Rushton, SR Enterprises.

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People and Fish

Angling Dilemmas

Timing
Before a fishing trip or anytime.

Duration
Thirty to sixty minutes for full activity, or 5–15 minutes to discuss one dilemma.

Location
A quiet place; the setting and atmosphere should be emotionally safe and respectful.

Life Skills
Critical thinking, decision-making, character, teamwork, responsible citizenship, accepting differences, self-discipline, communication.

OBJECTIVES

Participants will be able to:

- Practice choosing the most "right" course of action when confronted with an ethical dilemma while fishing or taking part in other outdoor activities.
- Examine their personal values, beliefs, and attitudes regarding responsible, ethical behavior while fishing.

Age/Stage
Fry, fingerling, young adult, adult.

Across the Curriculum
Social Studies.

Correlations
Social Studies:

Background/History
Participants will work in small groups discussing specific, age-appropriate angling/outdoor dilemmas and will practice choosing the most right (most ethical) course of action in response to the dilemma. The youth will discuss their decisions.

In many cultures, it is human nature to consider one's personal interests first. This activity can help youth see that often a choice made to benefit themselves may not be the most right thing for the resource or for the sport of fishing. Choosing to keep their limit of perch when it's known that the population is down is one example. The current regulations allow for the limit, so why not keep them all?

We'd like to think that the dilemmas offered in this activity help to "pump-up" those ethical reasoning "muscles" by getting youth to think broadly, ask tough questions about their own values, and ultimately, think critically and consider many choices when making ethical decisions about what's "most right."

Ethics offer a systematic approach to guiding our behavior. Angling or outdoor ethics provide personal guidelines for determining whether one action is more right than another, while fishing. Angler ethics education helps youth consider behavior that includes thoughtfulness toward others and responsibilities toward the natural world (including non-human beings) and things that may be impacted by our activity. It also includes a consideration of obligations to angling, to the perpetuation of its traditions, and to other anglers—those who have gone before, those who fish today, and those who will make up future generations of anglers.

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Materials

- Copies of dilemma cards

Procedure

1. Ask youth if they have ever heard about the Golden Rule: *Do unto others as you would have them do unto you.* This is one example of an **ethic**—a personal guideline that helps you choose how best to act in a certain situation. Ask: How is an ethic different than a law? (A law is a strict, clear guide to what is right vs. wrong. Laws are agreed upon by people living in a community and enforced by law officers. An ethic, however, is something personal, unwritten, and not enforced by others. An ethic guides what you do when no one is watching!)

2. Tell the youth this story as an example: It's a beautiful day, the fish are hitting well, your best friend is fishing nearby, and...well, it just doesn't get any better than this.

   Both of you have caught your limit of fish. You decide, with your buddy, to fish just for fun for the rest of the day. You bend down the barbs of your hooks, and you keep on catching fish and releasing them.

   Then your buddy catches a really big one, plenty big enough to win the weekend tournament. With a wink, your buddy slides a dead fish off the stringer, drops it in the water, and puts the big one on the stringer to keep instead.

   What should you do? (Let the participants give some answers.) How do you choose which is **most right**—loyalty to your buddy or abiding by the law and the rules of the tournament? Do you have any responsibility to the fisheries resource? Which is more important—the resource or your friendship? Do we have any responsibilities for the future of fishing in this area? What else should you consider when faced with a choice like this? Are there any consequences of the choices you might make? Are there any guidelines that help you to know if one action is more right than another?

   Every day each of us must make decisions. These decisions are based on the values we hold about what is important in our lives. As anglers, we are faced with these decisions as well.

3. Divide your group into small groups of 3–4 youth.

   Tell the youth that you will give each group a dilemma card. (You may give all groups the same dilemma, which will make discussion of the dilemma easy later; or you could give each group a different dilemma. Make sure to give the groups an age-appropriate dilemma. You can always give older youth some of the dilemmas designed for younger kids, but it is hard for younger kids to consider the complex dilemmas labeled as most appropriate for teens.) Tell the groups that a dilemma is a situation, with characters and a scene, but with many possible endings. A dilemma presents a challenge that needs to be resolved, but it also presents the group with more than one choice of possible actions.

   Have the groups read the dilemma. Tell them to consider what they should do if faced with the dilemma. Have them consider these questions, too: What responsibilities do you have in the situation in your dilemma? Do you have responsibilities to other anglers, friends, the fish, the habitat, a landowner? What would others think of your decision in this situation? What is most right?

4. Give the groups time to discuss their dilemmas. Visit each group, and listen to the conversations. Try not to lead them to your own perspective of the "one right answer." Let them have their own discussions. If discussion stops, ask a question (see questions below for ideas) to get the discussion going again.

5. Have the groups share what decision they made for how a person could act in the situations given in the dilemmas. Ask the youths to consider these questions:
   - Would you act the same way if the other person(s) in the situation were parents? Your closest friends?
   - Would you act the same way and make the same decisions if there was a certain species of fish involved in the scenario? If the population of fish was abundant? If the population was scarce?
   - What responsibilities do you have in the situation...to others? To the resource/fish/habitats? To the future of angling? To yourself?
   - Would you be proud of your action if it was reported on the front page of your local newspaper? If your parents saw your action?

Share with youth that it is common that two or more ethical duties might compete as you choose appropriate actions when faced with a dilemma. In fact, some of the situations and questions posed in the dilemmas are really tough ones. How can the individual or group decide what is most right and for whom? Which is most important? For some, it helps to think about these questions when considering interests.

Another way to think about our responsibilities is this:

- We are responsible for the resource (fish and their habitats). Our greatest duty may be to protect the natural world that supports and sustains both the outdoor activity and

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ultimately life itself. From this duty follows our responsibility to protect and enhance habitat, and individual species.

- We are responsible for the sport or traditions of fishing. Our next duty is to the sport or activity we love to do—to protect its traditions, to enjoy our heritage, and to act responsibly to help others think of anglers in a positive light and accept our interest in fishing.
- We are responsible to ourselves and our personal values. Once the above duties are met, we can consider our own personal needs, values, and desires.

Certainly, older youth are best able to think about these philosophical bases for ethical decisions. For younger youth, simply practicing decision making with the simplest dilemmas, sharing their decisions, and explaining the reasons for their decisions will be a good start to understanding ethical angling!

Tips for Success

- Adapt and modify the dilemmas for your local fishing waters and issues!
- Make sure to let the youth discuss the dilemmas themselves. Simply listen as you move from group to group, so that you can later summarize and report back to the group what types of things you heard them discuss.

Adaptations

Have teens choose a local issue involving conflict among anglers, or between anglers and other resource users. Learn all about the roots of the conflicts, and attempt to work with the groups to resolve the issue.

Extensions/ Additional Resources

Read to the group essays by Aldo Leopold from his book *A Sand County Almanac;* one essay he wrote is about land ethics. Read also his essay about fishing called "The Alder Fork." Do activities from the well-known curriculum *Character Counts* with your youth.

Community Service

Youths can encourage other anglers and recreationists to make ethical decisions about behavior. Your group's actions can provide a non-confrontational, polite expression of ethical outdoor behaviors. Your group could conduct an information campaign for more ethical behaviors for using personal watercraft, or in boating/waterskiing. Essentially, each youth can be a role model that may positively influence the behavior of others.

Train older teens in how to use the *Character Counts* curriculum with younger youth. Have teens plan and conduct a Character Counts Day Camp for 5- to 8-year-olds. Give the day camp an outdoor theme!

Exhibit/Sharing

Have youth write about ethical dilemmas in their fishing journals. Display the journals at a local fair. Make a standing display about ethical choices, using pictures from sporting and outdoor magazines.

Career Opportunities

Conservation officer, community volunteer teaching about character, 4-H agent.

Source

Adapted from an activity in the National 4-H Sportfishing Curriculum written by Kelly Carter-Matthews and Bruce Matthews. Additional ideas drawn from activities in the Idaho 4-H Sportfishing Program.

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DILEMMA 1

You are fishing at a small river that flows into Lake Michigan. Someone near you crumples up the wrapper from a new lure and drops it into the water. It floats toward you. What should you do?

DILEMMA 2

The best fishing in your town is in a little pond owned by a woman who does not like to let anyone on her land. Your friend wants you to sneak onto her land and go fishing. What should you do?

DILEMMA 3

You're enjoying a beautiful day fishing on a small stream. All at once, a noisy family comes crashing through the brush and starts having a picnic on the bank nearby. Should you do or say anything?

DILEMMA 4

You see another fisherman drop a wad of fishing line in the bushes. What should you do?

Dilemma 5

You're fishing in a catch-and-release area—a stretch of the AuSable river that flows into the Great Lakes. You hook a fish deeply, it is bleeding badly. You aren't able to help the fish. You watch as it slowly floats away, belly up. What should you do?

Dilemma 6

Your buddy is catching all the fish. She reaches her limit, and since you haven't caught all of your limit of fish, she asks you to start keeping her fish. Should you do it? What if it was your father?

Dilemma 7

You're fishing in a tributary stream and come upon a trout in the act of building a redd (a nest) and spawning. Do you try to catch her? Why, or why not? What if she were obviously a record fish?

Dilemma 8

The smelt run is very heavy this year. You are fishing at night, near the mouth of a river that empties into Lake Michigan. You've already taken many more smelt than your family or any of your neighbors can use. Tonight looks like it will be another good night for dipping smelt. Should you keep fishing?

Dilemma 9

Your buddy tells you that his derby-winning fish has been in his freezer for four months before the derby date. "Caught him last spring, before the season was open. Knew he was a derby-winner as soon as I caught him. Don't tell anyone, okay?" Do you tell?

Dilemma 10

You're fishing for walleye in May, before the bass season opens. You come upon an area that is thick with spawning bass, and they seem very willing to take your jig. You aren't going to keep any, but what's the harm in having some fun fishing for them? What will you do?

DILEMMA CARDS FOR PARR (AGES 9-12)

Dilemma 11

The person fishing next to you is crowding you, casting over your line and making it tough for you to fish. You politely ask him to give you more room. He swears at you, and says if you want him to move you're going to have to make him. Do you try? What do you do?

Dilemma 12

You catch a huge walleye in a bay on Lake Michigan. The local outdoor writer is coming to take your picture and interview you. Do you tell her where you caught it?

DILEMMA CARDS FOR SMOLTS (AGES 13-15)

Dilemma 13

While fishing the Pere Marquette River, a famous trout fishing area in Michigan, you come upon a fly box full of beautifully tied flies sitting open on a rock at the edge of the stream. No one else is around. What do you do?

Dilemma 14

While helping the hatchery truck stock local streams, the driver says her aerator, a machine that provides oxygen to the fish, has stopped working. She will have to drop the rest of the trout at this bridge. Do you tell anyone?

Dilemma 15

The stream where you like to fish has a beautiful pool that you can't fish because the brush around it prevents you from casting. Should you cut down the streamside vegetation to give you a chance to fish the pool?

Dilemma 16

You know where a huge trout is in the small stream nearby. You've watched it all winter, and you know its habits. You can't wait for opening day, because you just know you can catch that fish. A week before trout season the biggest jerk in school announces that he has found a huge trout in a small stream, and he brags that he is going there before light on opening day to catch that fish. You know it is the same fish, and you are mightily tempted to catch it the day before the season opens. Do you? What do you do?

Dilemma 17

You and your friends are spending time along the Grand River, in the city of Lansing, Michigan, watching salmon move up the fish ladder. While you are there, you see a group of teens snagging the salmon as they move up the fish ladder. You try to call the local Conservation Officer, but all of the phone lines are busy, and the officers are busy responding to other calls. What will you do?

Dilemma 18

It's opening day of bass season and the fishing is ridiculously easy. You've already taken your limit home and cleaned them when your neighbor stops by and asks if you can take her boss fishing this afternoon. Can you? Should you? Will you?

Dilemma 19

Your club has just finished cleaning up a mile-long section of the creek. When you get to the point where a truck driver was going to meet you to haul out the trash, you see that the land is newly posted and no truck is in sight. Neither is the landowner. You figure that the driver had trouble getting permission to bring in his truck. Now you're stuck with 20 bags full of wet, gross stuff and the choice between crossing posted land to get to the road or returning a mile to the starting point. What do you do?

Dilemma 20

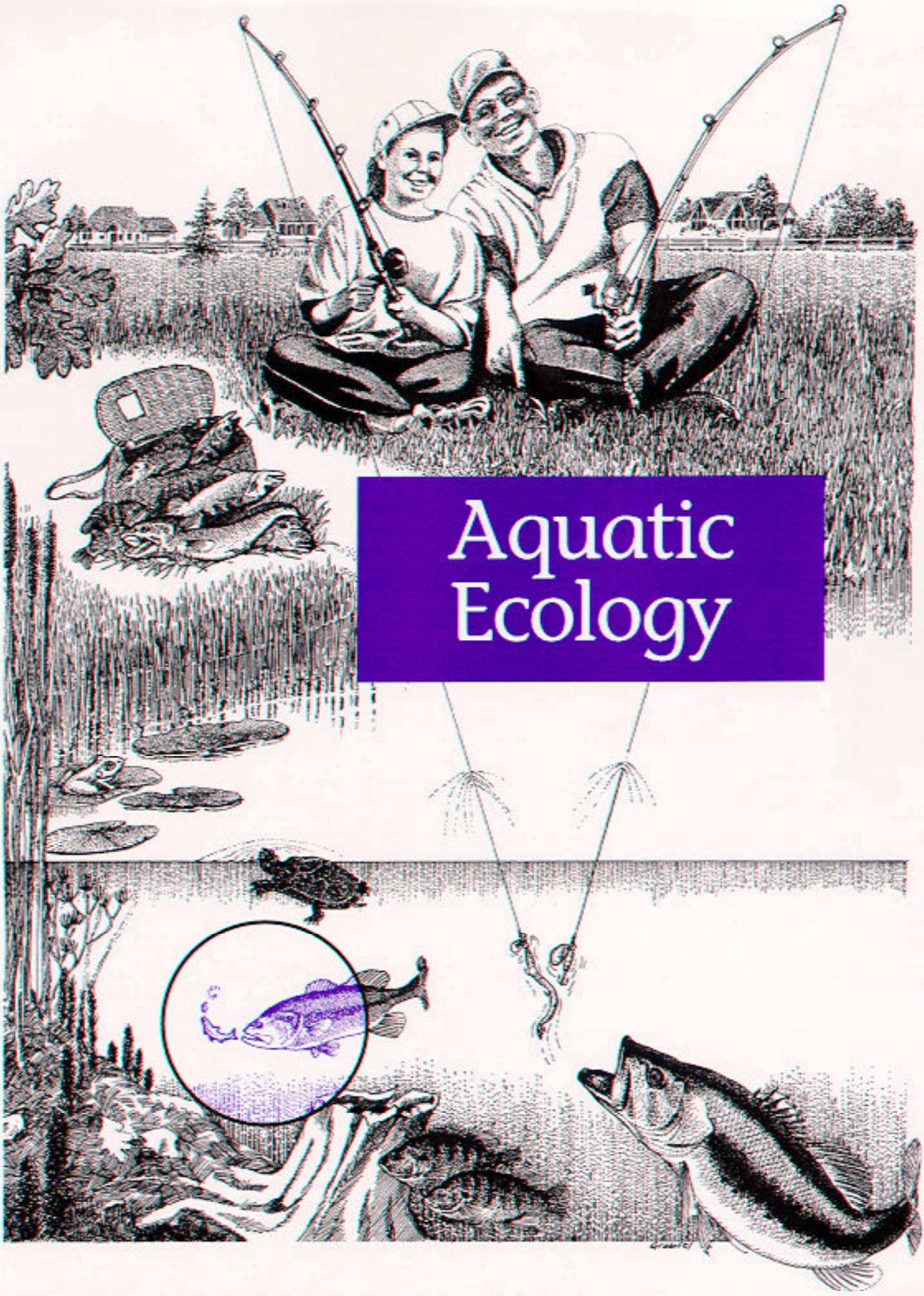
You are trolling for salmon with a group of teenage friends on Grand Traverse Bay of Lake Michigan. Up ahead, you notice some buoys marking commercial fishing nets. Your best friend, the driver of the boat, yells "Those darned fishermen!" and drives the boat even faster as though it will drive right through the nets. What will you do?

Dilemma 21

You are sitting in a fast-food restaurant when a group of three fishermen comes in. You know they are fishermen because they are wearing waders covered with mud. They roar out their food order, and call the waitress "honey," all the time laughing loudly at each other. They sit near you, talking about their fishing trip so everyone can hear them. They talk about the fish they caught in the morning, and how they're going after more this afternoon. After they leave, belching loudly, their table is a mess, the seats are muddy and there are puddles below on the floor. The people next to you say something about "disgusting fishermen." What should you do?

Dilemma 22

You're out ice fishing and see someone dumping a can of corn down the icehole. You ask why and she says it attracts fish. You weren't raised ice fishing that way, and you think it is disgusting. What will you do? Is the activity ethical? Does it make any difference if the angler is dumping eggshells? Chopped-up fish?



Aquatic Ecology

Build a Watershed: Just Add Water

Timing
After "Go Fish" and "Pour a Pond."

Duration
About 30 minutes.

Location
Classroom or outdoors.

Life Skills
Responsible citizenship, communication, concern for others, self-responsibility, critical thinking, decision-making, and problem-solving.

OBJECTIVES

Participants will be able to:

- Define and describe a watershed.
- Understand the term "drainage basin."
- Make inferences about the statement, "We all live downstream."
- As an angler, make a decision to care for our waterways.

Age/Stage
Fry, fingerling, young adult.

Across the Curriculum
Science.

Correlations
Science:

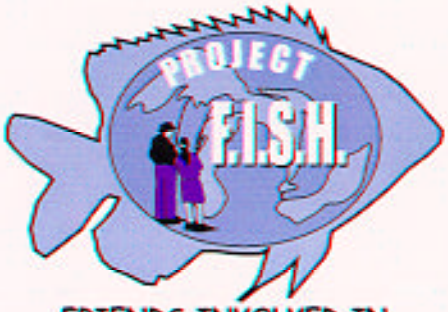
Background
Precipitation that falls on land either soaks into the ground or runs off. Water that does not soak in runs off into streams. Streams usually follow well-defined paths or channels. Channels then converge into a river. These small streams, channels, and rivers drain a well-defined or somewhat defined land area. This area of land drained is known as a **watershed.**

The size and shape of a watershed are defined by elevated lands, primarily hills and other land features. Elevated lands separate watersheds from one another by causing precipitation runoff to flow in different directions down one side or the other of the elevated area.

All watersheds eventually empty their waters into larger bodies of water (such as one of the Great Lakes). These larger bodies of water then transport their waters to a sea or ocean. Watersheds can be enormous or quite small. Large, well-established watersheds supporting major rivers are known as river or **drainage basins.** Michigan has 12 major drainage basins: Detroit, St. Clair, Maumee, St. Joseph, Grand, Muskegon, Manistee, Saginaw, Au Sable, St. Marys, Escanaba, and the Menominee Rivers. Contact your local MDNR office to learn about the basin where you live or use a county map guide or large stream map.

The Fisheries Division of the MDNR is now organized to address fisheries management on a basin-wide basis (see map). This allows managers and those living in a watershed to better understand how to work together to improve watersheds for fish, fishing, and enjoyment.

Understanding what a watershed is and its function helps us



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to comprehend how we are connected to our resources. Some of the precipitation that falls in your backyard runs off to ditches, storm sewers, and brooks. Eventually, this flows into a creek, lake, or river. We use these waters for drinking, swimming, *fishing*, and other activities. Wildlife, too, depend on these waters.

What goes into the water at one place may travel downstream to many other locations. What goes into a watershed far upstream (e.g., eroded soil) may eventually make its way down to where you live. The water running by your town comes from areas upstream. The treated sewage water from your town may be fed back into the same river downstream of your town. The saying, "We all live downstream," is intended to make people realize that everyone lives in a watershed and is dependent upon others for clean water.

Materials

- Newspaper
- Large white garbage bag or plastic sheet
- Two or more spray bottles filled with water
- Washable markers and powdered drink mix

Procedure

Before the activity:

1. Fill spray bottles with water; use at least two and maybe more.
2. Find a nice level spot that can get wet or is easily cleaned up, preferably outside.

During the activity:

3. Crumple newspaper sheets and form a pile. Use at least six sheets; use more to make a larger watershed.
4. Cover the pile with a large white plastic bag, or fill the trash bag with the crumpled paper for a smaller watershed. Point out to the participants the topography, i.e. all of the high points, ridges, and low areas. Tell them that this plastic represents how our land looks, only on a much smaller scale.
5. With a colored marker, have a few of the participants mark where they would like to live. Use a different colored marker for each participant. Usually they will choose high areas away from each other. This adds to the impact of the following steps.
6. Have participants make "precipitation" over the watershed by spraying the plastic with the spray bottles. (**Note:** Spray bottle setting should be set to "mist.")
7. Once enough precipitation has fallen, have the participants note the "lakes" that form and the paths runoff takes (streams and rivers). Ask them if one participant has any impact on another and have them describe their reactions.
8. Define what a watershed is to the participants. A watershed is an area of well-defined or somewhat well defined land that is drained by small streams, channels or rivers.
9. Revisit the concepts learned in "Go Fish" and "Pour a Pond." For example: Ask, what are limiting factors for fish or ask if participants remember the diversity of life found in the hoola-hoop ponds they examined. Stress the importance of good habitat to sustain positive fish populations as seen in these activities.

Question whether our actions impact the quality of water in our watersheds. Ask what could be done to minimize pollutants (e.g., oils, fertilizers, or even eroded soil) from entering the watershed. Answers will be "don't use them," "use less," "plant things to stop or clean the water."

Tips for Success

- Listen to comments and build from them for teachable moments about your watershed.
- Be sure that there are enough ridges and low areas for real impact.

Adaptation

- Create two watersheds, one with no pollutants and one with powdered drink mix sprinkled over the area. The color of the watershed will change colors when the precipitation and runoff occur.
- Change the shape of the watershed (height, slope, flatness) and see the differences in flow speed and retention. Add a small sponge to one of the low areas to represent a wetland.

Extensions/ Additional Resources

Soil erosion...how does it or can it affect the watershed that provides fish habitat? (it may change or alter spawning habitat, nesting cover, or cover for fish food sources, e.g., aquatic invertebrates). See the activity "Runoff Race." Try activities from the *Wonders of Wetlands* curriculum produced by Environmental Concern, Inc., St. Michaels, Maryland, (410) 745-9620. Michigan workshops are provided through MUCC and Designs by Nature, P.O. Box 126, Mason, MI 48854, (517) 251-8585.

See also Simply Science—"Ridges to Rivers" Watershed Explorations, Michigan State University Extension and Berrien County Intermediate School District.

Introduce and teach this activity with topographic maps of your community. Obtain these

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to comprehend how we are connected to our resources. Some of the precipitation that falls in your backyard runs off to ditches, storm sewers, and brooks. Eventually, this flows into a creek, lake, or river. We use these waters for drinking, swimming, *fishing*, and other activities. Wildlife, too, depend on these waters.

What goes into the water at one place may travel downstream to many other locations. What goes into a watershed far upstream (e.g., eroded soil) may eventually make its way down to where you live. The water running by your town comes from areas upstream. The treated sewage water from your town may be fed back into the same river downstream of your town. The saying, "We all live downstream," is intended to make people realize that everyone lives in a watershed and is dependent upon others for clean water.

Materials

- Newspaper
- Large white garbage bag or plastic sheet
- Two or more spray bottles filled with water
- Washable markers and powdered drink mix

Procedure

Before the activity:

1. Fill spray bottles with water; use at least two and maybe more.
2. Find a nice level spot that can get wet or is easily cleaned up, preferably outside.

During the activity:

3. Crumple newspaper sheets and form a pile. Use at least six sheets; use more to make a larger watershed.
4. Cover the pile with a large white plastic bag, or fill the trash bag with the crumpled paper for a smaller watershed. Point out to the participants the topography, i.e. all of the high points, ridges, and low areas. Tell them that this plastic represents how our land looks, only on a much smaller scale.
5. With a colored marker, have a few of the participants mark where they would like to live. Use a different colored marker for each participant. Usually they will choose high areas away from each other. This adds to the impact of the following steps.
6. Have participants make "precipitation" over the watershed by spraying the plastic with the spray bottles. (**Note:** Spray bottle setting should be set to "mist.")
7. Once enough precipitation has fallen, have the participants note the "lakes" that form and the paths runoff takes (streams and rivers). Ask them if one participant has any impact on another and have them describe their reactions.
8. Define what a watershed is to the participants. A watershed is an area of well-defined or somewhat well defined land that is drained by small streams, channels or rivers.
9. Revisit the concepts learned in "Go Fish" and "Pour a Pond." For example: Ask, what are limiting factors for fish or ask if participants remember the diversity of life found in the hoola-hoop ponds they examined. Stress the importance of good habitat to sustain positive fish populations as seen in these activities.

   Question whether our actions impact the quality of water in our watersheds. Ask what could be done to minimize pollutants (e.g., oils, fertilizers, or even eroded soil) from entering the watershed. Answers will be "don't use them," "use less," "plant things to stop or clean the water."

Tips for Success

- Listen to comments and build from them for teachable moments about your watershed.
- Be sure that there are enough ridges and low areas for real impact.

Adaptation

- Create two watersheds, one with no pollutants and one with powdered drink mix sprinkled over the area. The color of the watershed will change colors when the precipitation and runoff occur.
- Change the shape of the watershed (height, slope, flatness) and see the differences in flow speed and retention. Add a small sponge to one of the low areas to represent a wetland.

Extensions/ Additional Resources

Soil erosion...how does it or can it affect the watershed that provides fish habitat? (it may change or alter spawning habitat, nesting cover, or cover for fish food sources, e.g., aquatic invertebrates). See the activity "Runoff Race." Try activities from the *Wonders of Wetlands* curriculum produced by Environmental Concern, Inc., St. Michaels, Maryland, (410) 745-9620. Michigan workshops are provided through MUCC and Designs by Nature, P.O. Box 126, Mason, MI 48854, (517) 251-8585.

See also Simply Science—"Ridges to Rivers" Watershed Explorations, Michigan State University Extension and Berrien County Intermediate School District.

Introduce and teach this activity with topographic maps of your community. Obtain these

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maps through MUCC at (517) 371-1041 or www.mucc@mucc.org.

Community Service

Share this activity with others at a fishing or sport show, fair, community function, or in school. Work with a local biologist or service club to do stream bank improvements or native vegetation plantings to reduce runoff.

Exhibits/Sharing

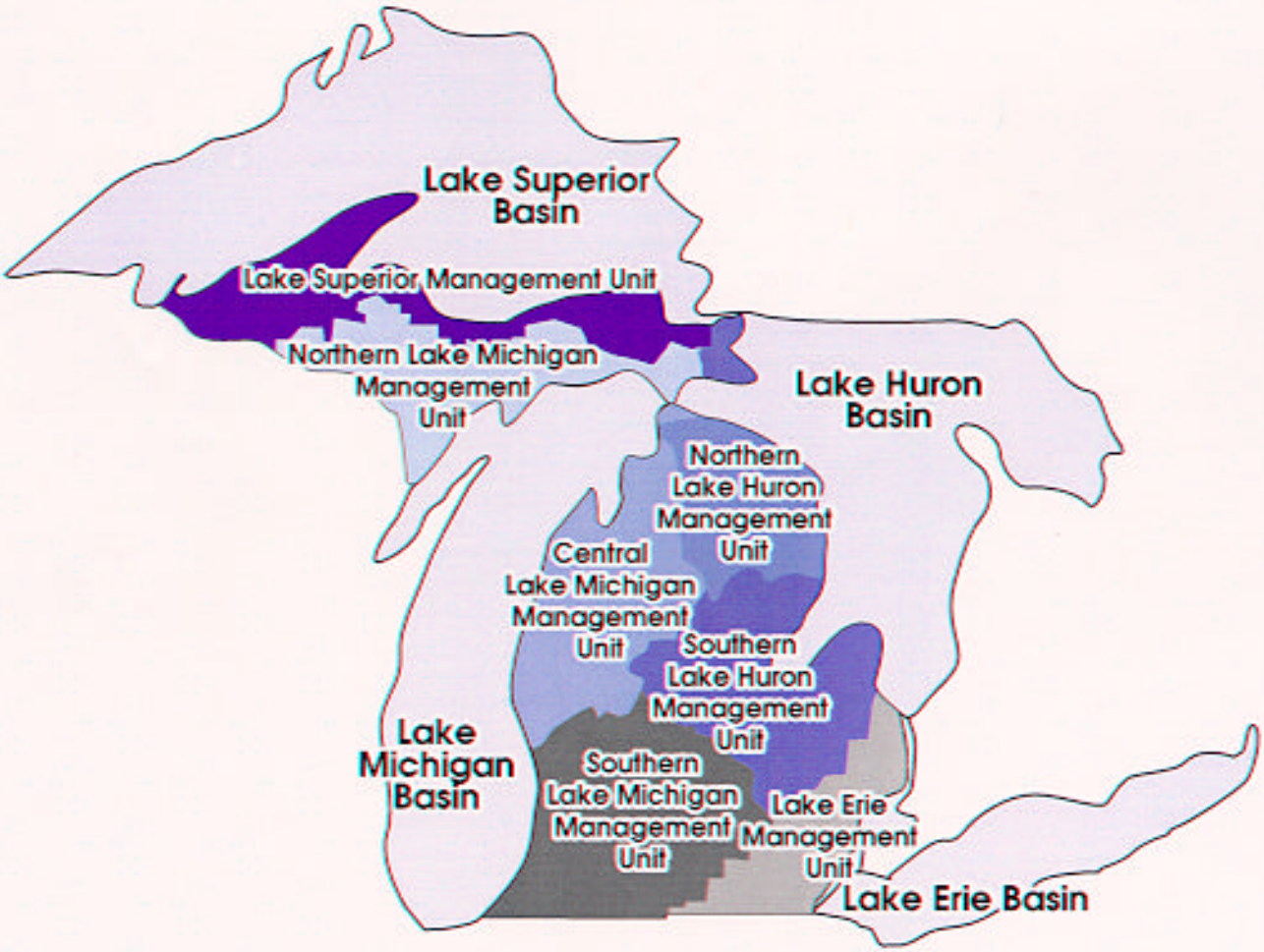
Set up a watershed model at a local public function. Educate the public as to the importance of caring for our watersheds. Natural Resource Conservation Districts and MDNR/MDEQ offices often need volunteers to provide public information at various functions.

Career Opportunities

Natural resource manager, land use planner, geologist, Extension agent, drain commissioner, organizer for a local watershed council.

Source

Adapted by Mark Stephens, MSU Department of Fisheries and Wildlife, from an activity in the National 4-H Sportfishing Curriculum by Carl Richardson, Pennsylvania Fish and Boat Commission, Bureau of Boating and Education.



Great Lake Basin and Management Unit Boundaries

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Fashion a Fish

Timing
Any time, best after "Pour a Pond."

Duration
About 30 minutes.

Location
Indoors or outdoors if not too windy.

Life Skills
Contributions to a group effort, communication, decision-making, cooperation, critical thinking, sharing, social skills.

OBJECTIVES

Participants will be able to:

- Classify fish according to body shape and coloration.
- Describe adaptations of fish to their environments.
- Describe how adaptations can help fish survive in their habitat.
- Interpret the importance of adaptations in animals.
- Learn to be better anglers by using lures, baits and other gear designed for various adaptations of fish.

Age/Stage
Fry, fingerling, young adult.

Across the Curriculum
Science, art.

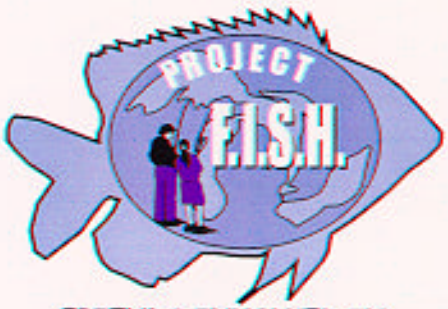
Correlations
Science:

Art:

Background
The major purpose of this activity is for participants to investigate the concept of adaptation in fish. An adaptation is a feature that increases the animal's likelihood of surviving and reproducing in their habitat. Aquatic animals are the products of countless adaptations over long periods of time.

When a habitat changes, either slowly or catastrophically, the species of animals with adaptations that allow them many options are the ones most likely to survive. Some species have adapted to such a narrow range of habitat conditions that they are extremely vulnerable to change. They are over-specialized and are usually more susceptible than other animals to death or extinction.

In this activity, the participants design a kind of fish. They draw pictures of the adaptations that their fish will have. As these adaptations become part of the fish's design, the fish becomes better suited to the habitat in which it lives. Because of the variety of conditions within each habitat, many different fishes can live together and flourish. This is important to the angler. As one learns particular adaptations of the fish they pursue and about the habitat where these adaptations occur, they can adjust their fishing method or technique. Some adaptations of fish are shown in the table following this activity.



FRIENDS INVOLVED IN SPORTFISHING HERITAGE

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Materials

- Adaptation cards (one from each of the five categories, for each group) **Note:** Body shape and coloration are the only cards needed for younger participants.
- Colored markers (4–5 sets of a variety of colors)
- Paper (newsprint size is best)
- Photos or drawings of a variety of Michigan fish (available from Project F.I.S.H.)

Procedure

1. Ask the participants to draw a kind of animal that has a special adaptation; for example, long necks on giraffes for reaching high vegetation to eat, large eyes set into feathered cones in the heads of owls to gather light for night hunting.

2. Conduct a group discussion on the value of different kinds of adaptations to animals.

3. Pool all of the drawings of adaptations. Categorize them into the following groups:
   - protective coloration and camouflage.
   - body shape/form.
   - mouth type/feeding behavior.
   - reproduction/behavior.
   - other (one or more categories the participants establish, in addition to the four above that will be needed for the rest of the activity).

Note: The first three steps are optional for younger participants. The remaining steps need only include the adaptation cards for body shape and coloration; reproduction and mouth and fin type cards are optional for younger students.

4. Divide the adaptation cards into five groups of five cards each, one each of coloration, mouth type, fin type, body shape, and reproduction.

5. Pass one complete set of cards to each group of participants. There might be five groups with four to six participants in each group. If the group size is larger than about 30, make additional sets of adaptation cards.

6. Ask the participants to "fashion a fish" from the characteristics of the cards in the set they receive. Each group should:
   - Create an art-form that represents their fish.
   - Name the fish (common name and scientific name).
   - Describe and draw the habitat for their fish.
   - Design and describe what it would take to catch this fish.

7. Ask each group to report to the rest of the group about the attributes of the fish they have designed, including identifying and describing its adaptations. Ask the participants to describe how this kind of fish is adapted for survival.

8. (Optional) Now that the participants have some knowledge of adaptations, place the fish photos/drawings (these should be the same size photos/drawings or put onto cards of the same size) on the floor or table and ask the participants to categorize them according to their adaptations. See if they can get them into proper families, and have them describe how and where these fish may feed. This part of the activity is optional or may be done as a separate activity.

9. Playing the game "Concentration" or "Memory" can be done to reinforce what has been taught in this activity. Simply create a second set of photos or cut the ones you have in half (this is the reason to have the photos/drawings on the same size cards) and mix them upside down in columns and rows. Have the participants flip over two to find a match, if no match is found these two are turned back over for the next player's turn. If a match is found the player finding the match gets another turn. This will truly enhance the observation skills of any age group.

Tips for Success

Make sure that all of the participants are providing input to the drawing. Visit each of the groups to see if they need additional information or assistance, especially for younger participants.

Adaptation

- Have the groups create a three-dimensional fish with the particular adaptations out of scrap materials you make available. These can then be made into a display about adaptations.
- Visit a Creation Station in your community to pick up recyclable materials.
- See "Mixed Creel" for "Smash Can Fish."
- Use one card from a set and have participants find photos of fish with that particular adaptation.

Extensions/ Additional Resources

- Invite a taxonomist from a local college or state or federal agency to speak at a future meeting.
- Contact a local charter, commercial fisherman, biologist, or even a taxidermist to have them provide a variety of fish species for your group to examine.

Community Service

Visit a local senior center, school, or club function and do the activity with them. It is fun for all ages.

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As anglers and good natural resource stewards, it is our duty to pass on our knowledge.

Exhibits/Sharing

Create three-dimensional and poster fish for a local public area. This is a great fair project for both school and 4-H or club events.

Career Opportunities

Taxonomist, taxidermist, artist or cartoonist, biologist.

Source

Adapted by Mark Stephens, MSU Fisheries and Wildlife Department, from *Aquatic Project Wild—Aquatic Education Activity Guide.*

Adaptation	Advantage	Examples of Fishes from Great Lakes Watersheds
Mouth		
Sucker-shaped mouth	bottom feeds on very small animals	sucker, carp
Elongated upper jaw	feeds off bottom	sturgeon
Sucking disk	attaches to prey/substrate	sea and brook lamprey
Duckbill, elongated jaws	grasps prey	pike, muskellunge, gar
Extremely large, flexible jaws	surrounds prey	largemouth bass
Body Shape		
Torpedo shape	fast moving away from bottom	trout, salmon
Flat-bellied	bottom-oriented swimmer	catfish, sucker
Vertical disk	feeds above or below in slow water	bluegill, pumpkinseed
Wide/horizontally flattened	bottom dweller	sculpin, sturgeon
Long and slender, scaleless	attached feeder, needs low resistance	lamprey
Coloration		
Light-colored belly	predators have difficulty seeing it from below	most minnows, perch
Dark upperside	predators have difficulty seeing it from above	bluegill, bullhead, catfish
Vertical stripes	can hide in vegetation	muskellunge, bluegill, yellow perch
Horizontal stripes	can hide in vegetation	white bass
Mottled coloration	can hide in rocks and on bottom	trout, rock bass, darters
Reproduction		
Eggs deposited on bottom	hidden from predators	trout, salmon, minnows
Eggs deposited in nests	protected by adult males	bluegill, bass, stickleback
Floating eggs	dispersed in high numbers	freshwater drum
Eggs attached to vegetation	stable until hatching	perch, northern pike, carp
Live bearers	high survival rate	guppy, mosquito fish, *Gambusia* (no native Michigan species)
Fin Shape/Location		
Large pectoral/pelvic fins	help stay on bottom in moving water	johnny and rainbow darters
V-shaped tail	continuous movement	channel catfish, rainbow smelt
Anal and dorsal fins—posterior	burst speed power	pike, muskellunge, gar
Anal and/or dorsal spines	protection from predators	sunfish, stickleback
Pectoral fins on side	good for sharp turns and "rowing"	sunfish, black bass, yellow perch
Pectoral fins on bottom	good for stabilizing in flowing water	trout, suckers
Long dorsal fin	used for propelling forward or backward without body movement	bowfin

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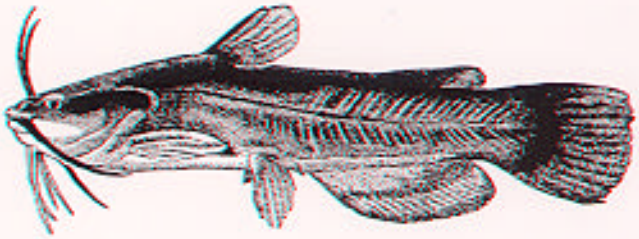
COLORATION

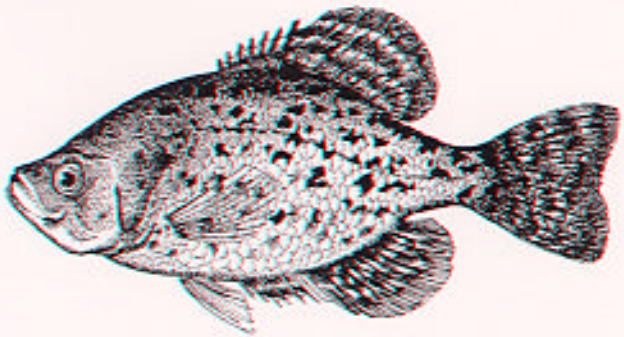
Light-Colored Belly
(Most Minnows)

COLORATION



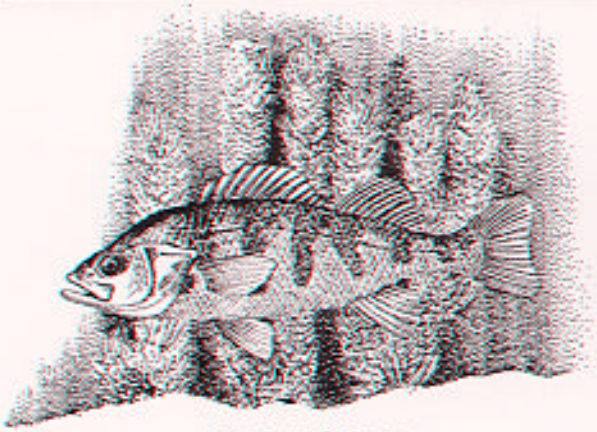
Dark Upperside
(Bullhead)

COLORATION



Mottled
(Crappie)

COLORATION



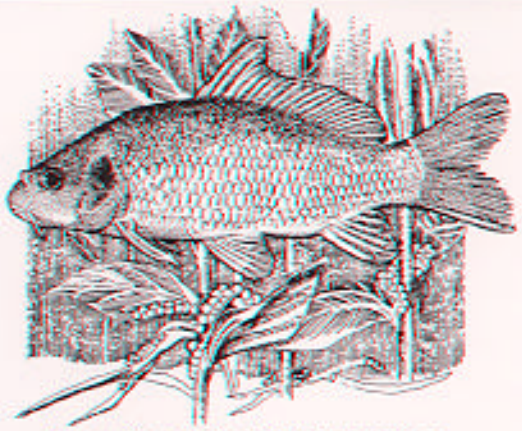
Vertical Stripes
(Yellow Perch)

COLORATION

Horizontal Stripes
(White Bass)

ADAPTATION CARDS

REPRODUCTION

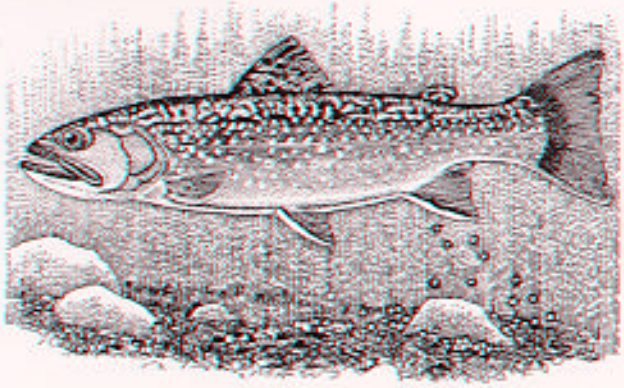


Eggs Deposited in Vegetation
(Carp)

REPRODUCTION

Eggs Deposited in Nest
(Pumpkinseed)

REPRODUCTION



Eggs Deposited on Bottom
(Trout)

REPRODUCTION

Free-Floating Eggs
(Freshwater Drum)

REPRODUCTION

Live Birth
(Gambusia)

ADAPTATION CARDS

FIN SHAPE AND LOCATION

Large Pectoral or Pelvic Fins
(Rainbow Darter)

FIN SHAPE AND LOCATION

Anal and Dorsal Fins Posterior
(Northern Pike)

FIN SHAPE AND LOCATION

Pectoral Fins on Side
(Largemouth Bass)

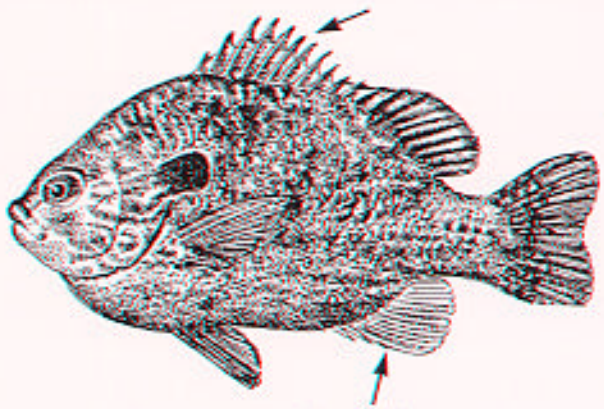
FIN SHAPE AND LOCATION

Long Dorsal Fin
(Bowfin)

FIN SHAPE AND LOCATION

V-Shaped Tail
(Rainbow Smelt)

FIN SHAPE AND LOCATION



Anal and/or Dorsal Spines
(Sunfish)

ADAPTATION CARDS

FIN SHAPE AND LOCATION

Pectoral Fins on Bottom
(Sucker)

ADAPTATION CARDS

SHAPE

Flat-Bellied
(Catfish)

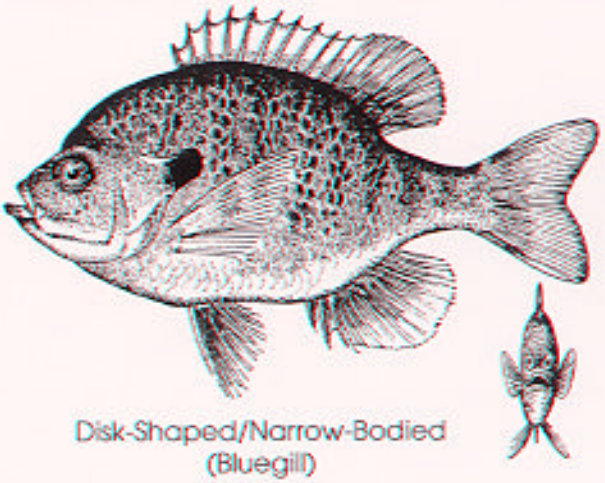
SHAPE

Torpedo Shape
(Trout)

SHAPE

Horizontally Flattened
(Sculpin)

SHAPE



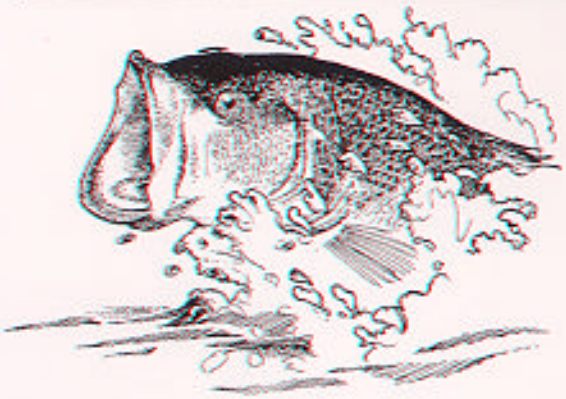
Disk-Shaped/Narrow-Bodied
(Bluegill)

SHAPE

Long and Slender
(Lamprey)

ADAPTATION CARDS

MOUTH/FEEDING



Very Large Flexible Jaw
(Largemouth Bass)

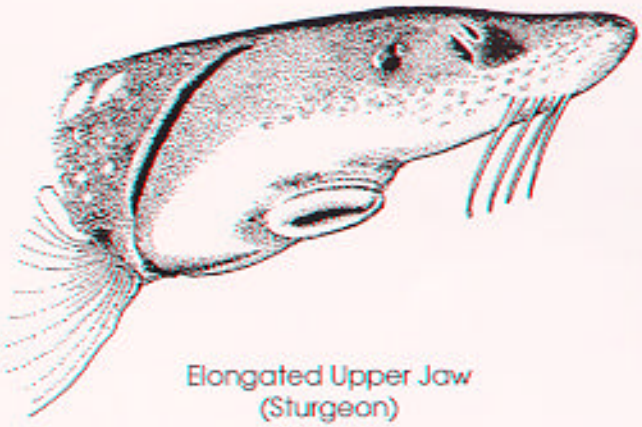
MOUTH/FEEDING

Sucking Disks
(Lamprey)

MOUTH/FEEDING

Duckbill Jaws
(Northern Pike)

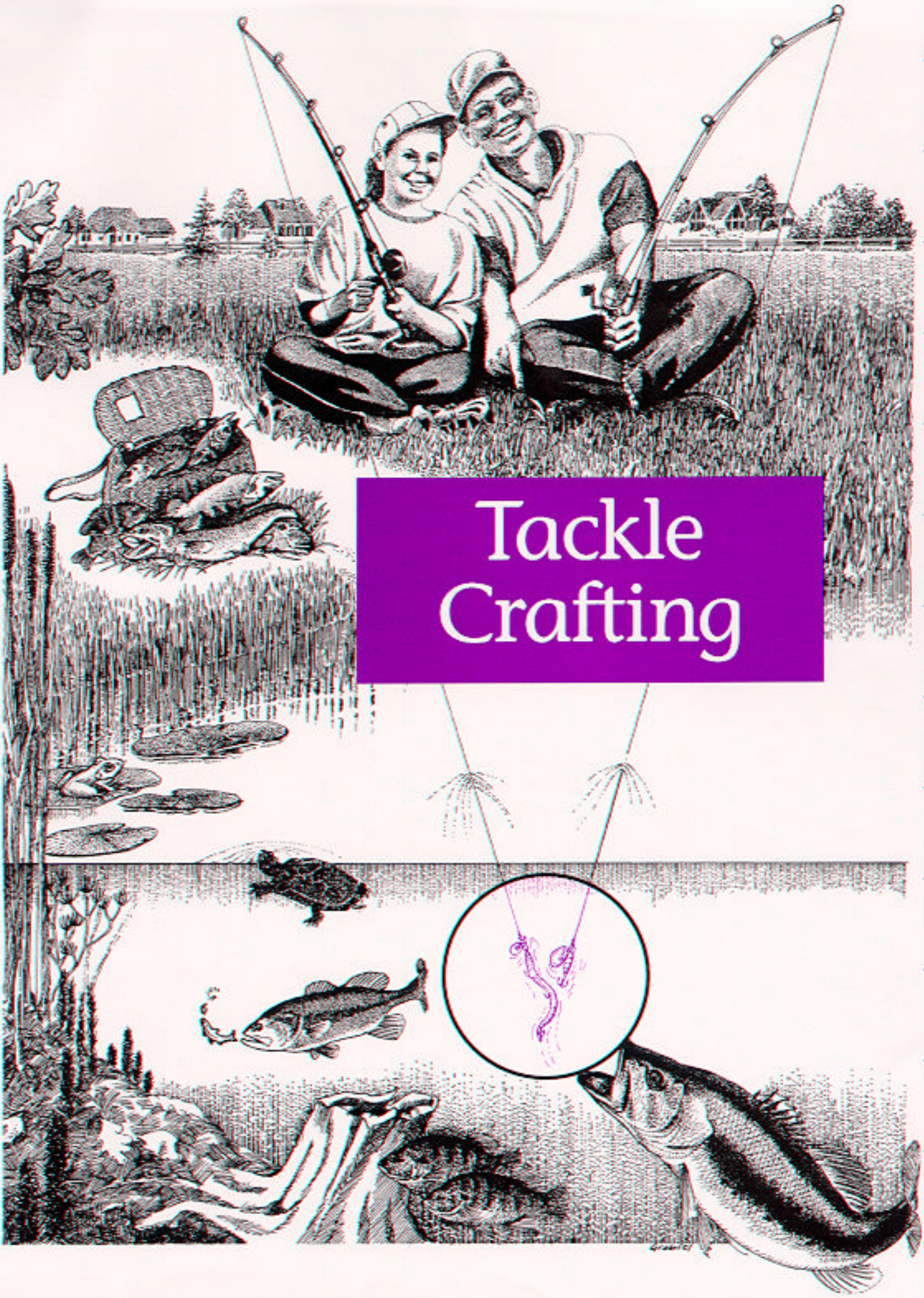
MOUTH/FEEDING



Elongated Upper Jaw
(Sturgeon)

MOUTH/FEEDING

Sucker Shape
(Sucker)


Tackle
Crafting

INTRODUCTION TO
Tackle Crafting

Tackle crafting involves a wide variety of skills and interests. Some of them are simple and easily mastered. Others are complex, requiring a longer time to develop. These activities may lead to entrepreneurial endeavors, careers, or simply expanding the recreational benefit of time spent fishing and preparing to fish. Tackle crafting can also connect the person who enjoys fishing to our heritage—rich traditions of how to make lures and equipment passed on to today's youth by older generations.

The volunteers working with our basic tackle-crafting activities and the participants involved in them will have fun learning with each other and creating some very useful fishing equipment. However, it is very important to remember that tackle crafters with limited skills will learn best if simple skills are learned before attempting more complex projects. For example, learning how to tie a simple clinch knot is fun for the participant and teaches a basic skill that will be applied in many other activities. Building things to a pattern or model teaches the participant to follow that pattern or model—a step that should be taken before free creativity takes over.

Clearly, careful attention to potential hazards and safety is required when young people are using paints, molten metals, or sharp hooks—more than when they are simply tying a knot. Being prepared and covering safety is a leader's responsibility and is covered in the activities and at Project F.I.S.H. training workshops.

Several of the activities included in this set are developed in sequence and are designed to teach, then to reinforce, basic skills. For best results, they should be taught in the sequence in which they are presented. When this is done, the more basic skills are learned first and are reinforced and expanded in following lessons. Skipping a basic lesson may result in complications and frustration later. A simple-to-complex learning strategy is always most beneficial to the participant. Keep in mind that we want the participants to continue with fishing-related activities.

Be sure to consider the age and skill level of your group members. Remember that they learn at different rates and may have different levels of ability. Please remember that the product of these activities is the young person's participation, not the items that will be produced. Patient, positive leadership by an active listener and cooperative leader will reach the objective of helping kids to achieve their potential most effectively.

The activities are a guide, learning never stops, and you are a role model and hero to kids whether you want that position or not. Help others to have some of the fun of teaching and draft your experienced participants as assistants. They will grow from this leadership experience, and so will your new tackle-crafters. Finally, if you have good ideas for activities in this area, please send them to us. We will be happy to share them with others.

Post these ideas on the Project F.I.S.H. website message board for other instructors to consider.

Welcome to some fun stuff! Have fun with the kids and try some new things yourself. Happy tackle crafting!

Extensions/ Additional Resources

The following is a list of organizations and businesses that have materials and contacts available for tackle crafting. In addition, contact local sporting

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goods stores or sportsmen's clubs for potential instructors.

Project F.I.S.H.
(517) 432-2700
Web: http://www.projectfish.org

American Sportfishing Association
1033 N. Fairfax, Suite 200,
Alexandria VA 22314
(703) 519-9691
Web: www.asafishing .org

Gander Mountain Stores
(248) 738-9600
Web: www.gandermountain.com

Cabelas, Inc.
(800) 237-4444
Web: www.cabelas.com

Bass Pro Shops, Inc.
(800) 227-7776
Web: www.basspro.com

Jann's Netcraft
(800) NETCRAFT
Web: www.jannsnetcraft.com

Stamina, Inc.
(612) 926-1994
Web: www.staminainc.com

Tackle Crafting Books

The Complete Book of Tackle Making by C. Boyd Pfeiffer. Excellent resource.

Lure Making by Livingston, Ragged Mountain Press.

Source

Introduction adapted by Mark Stephens, MSU Department of Fisheries and Wildlife, from the National 4-H Sportfishing Curriculum, Dr. Ron Howard Jr., Professor and Extension Specialist, 4-H Youth Development, Texas Agricultural Extension Service, Texas A&M University, College Station, TX 77843-2473.

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No Minnows? Fake It!

Inline Spinners, Spinnerbaits, and Buzzbaits

Timing
Any time of year; excellent off-season activity.

Duration
Minimum of one hour per session recommended, variable with age group.

Location
Any well lighted area with adequate table space for each participant.

Life Skills
Critical thinking, decision-making, organization of work processes, problem-solving skills, personal safety, sharing, teamwork, cooperation, and marketable skills.

OBJECTIVES

Participants will be able to:

- Describe and practice safety while building fishing lures.
- Select types of lures appropriate to their area and fishing preferences.
- Make decisions on colors, actions, and types of lures to be made.
- Demonstrate lure actions and their relationship to catching fish.
- Demonstrate ability to build selected lures.
- Have fun while learning.

Age/Stage
Fry, fingerling, young adult.

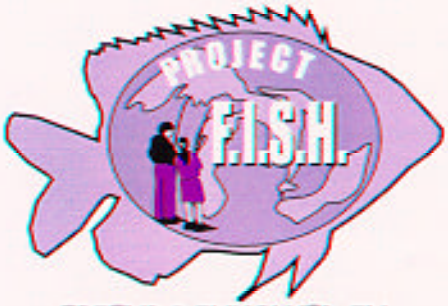
Across the Curriculum
Science, Art.

Correlations
Science:

Art:

Background
Lure building extends fishing to a year-round activity. It enables clubs to meet and do fishing-related activities during bad weather, slow fishing periods, and whenever fishing is not possible or an alternative activity is needed. Lure building can stand alone as an independent activity and need not be linked to a particular fishing activity. Depending on the expertise of the activity leader, lure building is appropriate for participants six years old and up. Lure-building activities should be designed to match the skill, experience, and maturity level of the participants. Many commercial lures are available for beginners to copy, requiring only minimal fabrication and assembly skills. More mature and skilled participants may prefer to create their own designs through understanding lures in the context of imitating specific prey.

Lure building is an intense, hands-on experience. Well-motivated participants will concentrate better on the details of this kind of activity. The smaller the group, the more successful the activity. With one instructor, no more than ten beginners are recommended, and six is far better. When recruiting a group, instructors should emphasize that this activity requires the ability to focus, concentrate and observe fine details.



FRIENDS INVOLVED IN SPORTFISHING HERITAGE

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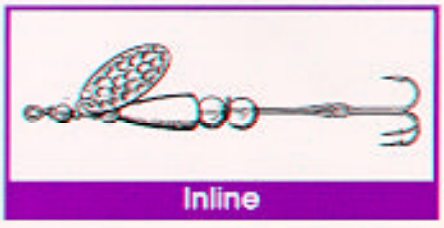
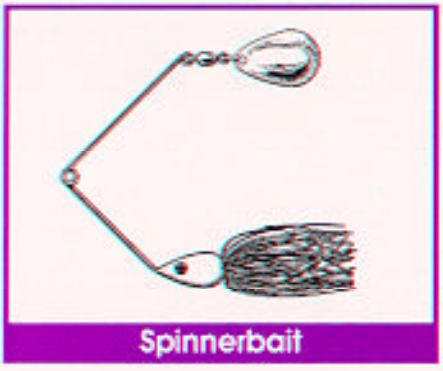
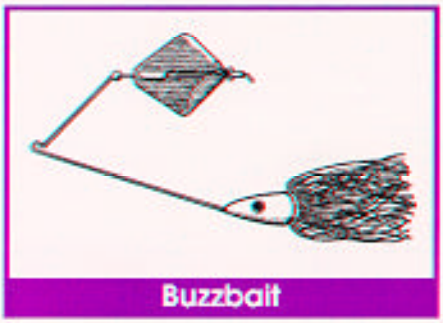
As a result of this activity, participants will have the opportunity to learn a variety of fine motor skills and gain knowledge about lure movement in water, relationships between lures and prey, and about fish visual perception.

Inline spinners, spinnerbaits, and buzzbaits are all very similar and can be combined into a single activity. Only when they are used in actual fishing will their differences become more significant. Basically, spinners, spinnerbaits and buzzbaits are all constructed on a semi-flexible, formed wire shaft of .035"–.040" diameter stainless steel. Various shaped blades, called **spinners,** are mounted on the shaft so as to permit free rotation as the lure is pulled through the water. All three lures are equipped with either treble hooks or a leaded single hook at the rear end and an eye for line attachment at the front. Additional embellishments in the form of colored beads, decals, skirts, and paint are sometimes added.


Inline


Spinnerbait


Buzzbait

These lures are designed to attract the attention of fish; the spinners vibrate and flash to attract attention both visually and neurologically through the fish's' lateral line system. As to their differences, inline spinners are the simplest in construction, while buzzbaits are the most complex. Spinnerbaits are somewhere in between.

Inline spinners consist of little more than a straight shaft with a treble hook at the rear, an eye in the front and usually a single blade in the middle. These spinners are designed to resemble a small swimming fish that creates a lot of vibration and flashing for attraction. Spinnerbaits and buzzbaits have a more complex shape to the formed wire shaft, a cast metal body with a single hook embedded in it, and a fringed skirt mounted on the body. Spinnerbaits have a blade mounted on an offset branch of the shaft at an angle to the main shaft. Buzzbaits, designed to attract fish by sound, have one or more rotating propeller-like blades mounted on the main shaft or an offshoot of it. Buzzbaits also have one or more free-swinging blades on the main shaft. (See diagram of these three types of lures.)

Project F.I.S.H. focuses on simple inline spinners and encourages participants to explore the others as an extension.

Materials

- A "library" of lure catalogs
- Assortment of wire cutting/bending pliers, e.g., round and needlenose pliers, side cutters or end cutters
- Stainless steel lure wire with pre-formed eye
- Treble hooks, size in proportion to lure size #8 or #6 hooks (in plastic bonnets for safety)
- Assorted blade sizes and shapes
- Variety of bullet heads or lure bodies
- Clevises, for mounting blades on shaft
- Assorted decals and various-sized beads for additional decoration
- Assortment of manufactured inline spinners, spinnerbaits, and buzzbaits for demonstration
- Copies of "Lure Component and Construction" Participant Page
- Safety glasses

Note: Lure components are available from the Project F.I.S.H. website.

Procedure

1. Have the participants observe the variety of inline spinners by looking at catalogs and actual manufactured lures. Point out each of the components that comprise the bait: wire shaft, bead sizes and locations, clevis, and blade, bends in the shaft, and hook (see diagram). Have them visualize how the lure would go through the water. Remind the participants that inline spinners and spinnerbaits are designed to resemble small swimming fish or live food that creates vibration and flashing for attraction. Buzzbaits are designed to attract fish by sound.
2. Tell the participants that inline spinners are built backwards or upside down. In other words, the last piece put on is the hook. Keep this in mind when explaining each step.
3. Distribute the components to each participant. (It is always helpful to prepackage the components prior to the session.) Each participant will have the exact same materials for their first bait.

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4. After distribution, hand out the "Lure Component and Construction" Participant Page and review the components. Many of the components are very small and participants will need to keep careful track of them.

5. Distribute the pliers and cutting tools for participants to share. You may want to distribute the cutting tools at the time for cutting, especially for younger participants who will need help.

6. Have the participants place one of the smallest beads on the wire shaft with the formed eye down. Demonstrate the steps while explaining.

7. Next, set aside the wire, and put the clevis through the hole in the blade. Put the wire shaft through the two holes or the clevis (not through the hole in the blade—this is a common mistake). Be sure to remind the participants that the lure is being built backwards, and that the concave part of the blade must be facing up or toward them while the wire is held upside down (see diagram).

8. Put on the second small bead, followed by the lure body or bullet head. (These may be painted by following the steps in the "Jigs and Jigalooning" activity prior to this session.)

9. Next, place two or three of the larger colored beads after the bullet head. If prepackaged components are supplied, explain to the participants that on their future lures they will be able to choose their own colors and sizes.

10. For the next step, participants will need the round or needlenosed pliers. Show them how to grab the wire approximately 1 inch from the last bead and bend the wire over one side of the pliers so the end is pointing toward the eye. Younger participants will need help in doing this. (See diagram for bending the wire.)

11. Next, either have the participants, assistants, or yourself cut the tag end of the wire after the bend at the last bead—**not the main wire that the bead is on.** Tell them they should be able to slip the last bead over the wire end, so they will have two wires through the last bead, when it comes to that step.

12. Have them put on the final and most important piece, the hook. Be sure to tell participants to keep the hook bonnet on for safety. Slide the last bead over the wire down toward the hook, and, with the pliers, make a small bend on the end so the bead won't slide off. You are now done with assembly. Use the spinner as is or add decals or metallic tape to be creative!

13. Inline spinners are fished by casting them toward structure (habitat) and retrieving them at various speeds to reach different depths.

Tips for Success

- Prepackaging is always helpful. Having enough help for larger or younger groups will help alleviate frustration and confusion. Participants will appreciate a slow, step-by-step process. Although some participants may be faster than others, keep the group at the same stages.

Adaptation

- Divide the group members into various components (shaft, clevis/blade, bullet head, small beads, large beads, and hook) without having others know what they are. Have them assemble themselves in the proper order without talking.
- Create three-dimensional baits out of common items brought from home. Try tying hair, feathers or rubber onto the hook to add a little action.

Extensions/ Additional Resources

- Create spinnerbaits or buzzbaits as the next step in tackle crafting. Purchase a variety of components for each of these and get creative. These can be found at local tackle shops or ordered through sporting goods catalogs.
- Interview local anglers to learn about combinations of colors and spinner types traditionally used in different watersheds.

Community Service

As a project, build lures and sell them for a local fundraising charity. Teach others your skill to provide them a lifelong hobby.

Exhibits/Sharing

Create a display of crafted lures for a local tackle shop, school, or fair. Give step-by-step instructions to create a variety of lures and baits.

Career Opportunities

Tackle manufacturer or manufacturer representative, artisan, jeweler.

Source

Adapted and modified by Mark Stephens, MSU Department of Fisheries and Wildlife, from Al Fannin, volunteer with the New York State Sportfishing and Aquatic Resources Education Program. This activity appears in the National 4-H Sportfishing Curriculum.

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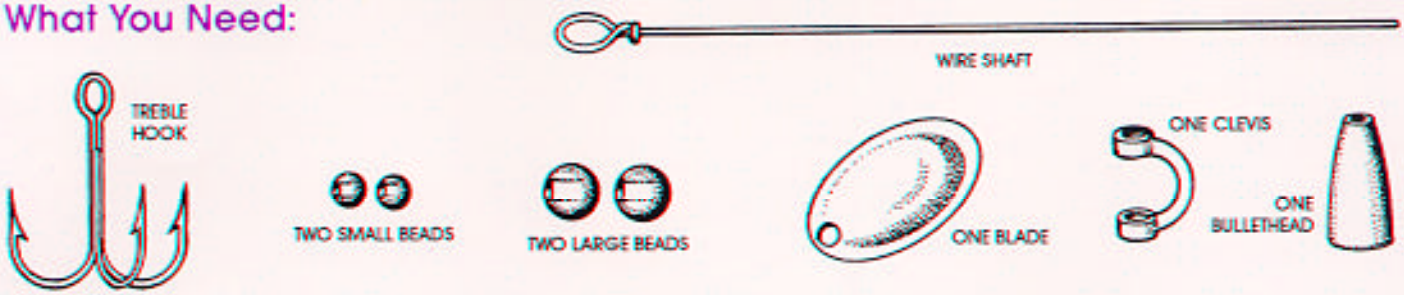
Making Tackle

INLINE SPINNERBAIT

What You Need:



A. Thread one small bead on wire shaft.

B. Thread clevis through blade and thread clevis on fish line.

C. Thread another small bead on wire shaft.

D. Thread bullethead on wire shaft with smaller end towards loop on shaft.

E. Thread two large beads on wire shaft.

F. Thread treble hook on wire shaft at end of shaft.

CUT HERE

G. Cut wire shaft end near bottom of large bead. Slide bead over the bent wire that you cut.

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FRIENDS INVOLVED IN SPORTFISHING HERITAGE

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