



ILLINOIS TRENDS: The US Fish and Wildlife Service (USFWS) reports fishing license sales in Illinois declined 16% between 2001-2011. The Illinois DNR reports fishing license sales declined by 11% between 2008-2017. There are over 100,000 less fishing licenses sold now than 20 years ago.

ISSUE: Fishing license sales and excise taxes on fishing gear directly relate to the funding of the Illinois Department of Natural Resources (IDNR) Division of Fisheries.

NATIONAL TRENDS: The USFWS reports over a 4% increase in fishing license sales nationwide over the past 10 years. Demographic data shows positive increases in youth, female, and Hispanic audiences.

4-H STRATEGY: Illinois 4-H offers a six week bass fishing SPIN Club curriculum focused on attracting Jr. High level youth to the sport of fishing with a specific focus on largemouth bass.

This is not a basic, first exposure to fishing experiences program. The intention of these lessons is to advance the interest, or spark, of fishing passions to a higher level. There are six lessons included designed to be visual and hands-on with youth at the Jr. High grade level.

The lessons will focus on aquatic ecosystems; fish biology; and include STEM activities relating to fishing gear. Youth enrolled in the 4-H Sportsfishing and/or Bass Fishing SPIN clubs will be eligible for special opportunities and fishing contests for prizes and recognition of their mastery!

The first 20 4-H leaders that contact me about this 4-H Bass Fishing initiative will receive a complete kit of supplies to conduct the activities listed in this booklet. To receive a supply kit simply contact Curt Sinclair, Illinois 4-H Youth Development Specialist at sinclair@illinois.edu. First come/first served. Supplies available for 200 youth.



4-H Bass Fishing Lesson Table of Contents:

Lesson 1: Spinnerbait "Sense" sation

Activity: Build your own spinnerbait. Understand every component of a spinnerbait and why they get noticed by bass!

Lesson 2: Know Knots:

Learn why you need strong knots for bass fishing:

Activity: Learn to tie the Trilene Knot and the Palomar Knot

Activity: Create Bass Club Team Bracelets using paracord first used to easily learn knot tying

Lesson 3: Soft Bait Rigs:

Compare pros and cons fishing with Monofilament line vs. Fluorocarbon line

Activity: Set up soft bait rigs using knots and line types:

Texas Rig; Carolina Rig; Wacky Rig; and Drop Shot Rigs

Lesson 4: Understanding Largemouth Bass Populations:

Study aquatic food chains; fish stocking rates; creel and size limits used by Fish Biologists to manage largemouth bass populations

Activity: Catching and cleaning bluegill

Lesson 5: Temperature and Eyesight Factors in Bass Fishing:

Learn how the eye of a bass works and why water temperature and water clarity effect largemouth bass behavior

Activity: Measure the temperature differences in water of different colors

Lesson 6: Spin Cast vs. Spinning Rods

Discover why most bass fishermen prefer spinning rods vs. spin casting rods.

Activity: Your rod is a lever. Measure why a longer spinning rod is preferred by most fishermen.



Lesson 1: Spinnerbait “Sense”sation

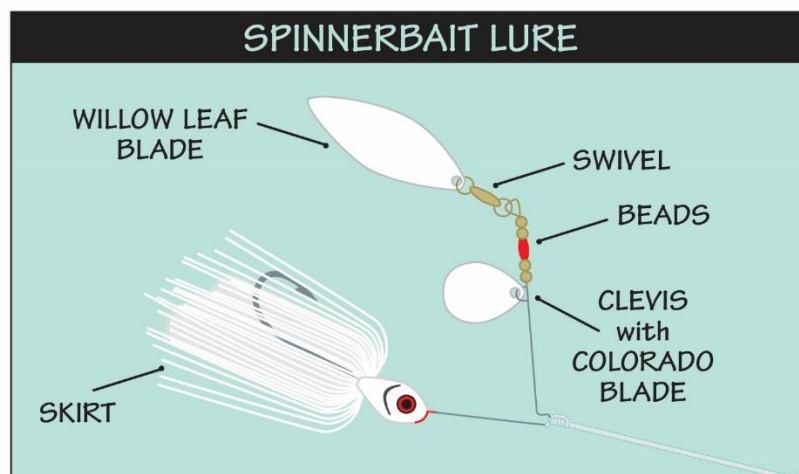
Largemouth bass swallow their prey whole. They are a top predator in many Illinois waters and dine on small fish, frogs, crawfish, and insects. Their eyesight is good, but they also have a sensory organ along their sides that can tell them where vibration of movement are coming from! Spinnerbaits can mimic many of the traits of the food, or prey, a bass likes to eat. The color, size, vibration, flash, and movement all can be adjusted in a spinnerbait design. For example, the type, number, and size of blades on a spinnerbait can all be changed (see diagram below). Did you know a Willow leaf blade turns faster than a Colorado blade creating different flashes and sound waves in the water as it moves?

How might you build a spinnerbait then to mimic the movement of a crawfish? How would you move this spinnerbait then in the water? High, low, fast, slow, sporadic, or steady?

Activity: Build your own 2-blade style spinnerbait.

Watch this video: <https://go.illinois.edu/4HSpinnerbait> ,or follow the written directions below:

1. Place Colorado blade on clevis, then thread clevis onto spinnerbait wire body.
2. Thread 3-4 beads on spinnerbait wire body for spacers.
3. Use pliers to bend a tight loop at top of spinnerbait wire – but make sure to place swivel inside loop before complete closure!
4. Put Willow-Leaf blade on snap swivel.
5. Slide skirt (from center of band) onto the hook and push completely up firmly to head of jig.



Parts list for Spinnerbait

¼ oz. spinnerbait frame; clevis; Colorado blade; 3/32 hollow beads; Snap Swivel; Willow leaf Blade;

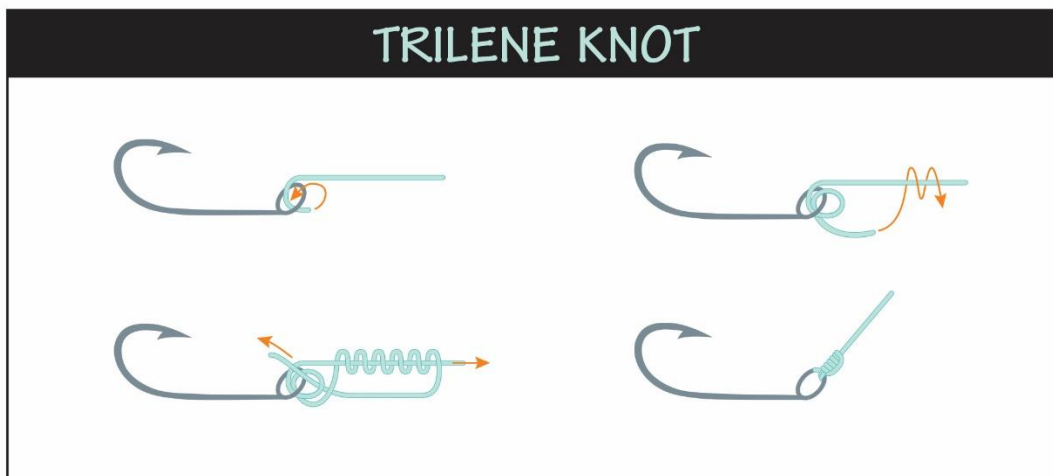
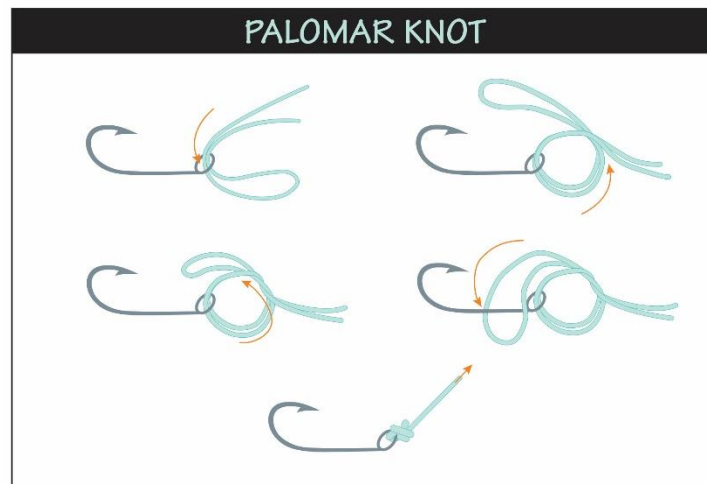
Pre-made skirt

Remember: There are dozens of variations of spinnerbaits! Change colors; blade sizes; blade styles; weights of lead jig heads; sizes of wire body; numbers of blades; etc. Try to match what the largemouth bass are feeding on naturally, then exaggerate these traits in your bait design!

Lesson 2: Know Knots

No matter how good you are at tying knots, your knot will always be the weakest point in your connection to a fish. However, a really good knot can retain 90 percent of the line strength! Losing a hooked fish due to a poorly tied knot is a sad ordeal for all – including the fish!

Activity: Parachute cord, or paracord, is a light weight rope useful for many tasks. It comes in a many colors. Use bright colored paracord to practice the moves of tying a knot before using fishing line. Paracord is easy to see and work with. Make a large hook from a piece of wire, or use a key ring as the pretend eye of a fish hook. Today learn to tie the Trilene Knot and the Palomar knot, then pick your favorite. These two knots are recommended when fishing for largemouth bass as they are very strong. **Hint:** When you do tie these knots with fishing line, use some saliva/spit for lubrication before cinching the knot down tight!



Optional Activity: Being a member of a team is a proud feeling of belonging. Identify your fishing club members by wearing a badge of honor such as a paracord bracelet to your 4-H Fishing Club activities! It means you've mastered the fishing knots and are a member of this team! All you need is 10 feet of paracord and your buckles. Learn how to make either a snake knot or cobra weave paracord bracelet from these videos:

<https://go.illinois.edu/4HParacordSnakeKnotBracelet>

<https://go.illinois.edu/4HParacordCobraKnotBracelet>

Lesson 3. Lines and Rigs for Largemouth Bass

Monofilament (shortened to just 'mono') fishing line has for very popular for nearly 60 years, but newer technologies are changing the fishing line choices. Though mono is much cheaper to purchase, knowing the details of other line characteristics can mean the difference between success and failure on a fishing trip.

Activity:

Given samples of two different types of fishing line, monofilament and fluorocarbon, study the characteristics of each as listed below. Design an experiment to test any of these characteristics (For example, to test for density differences, time the sinking rate of a 2 inch piece of each line type in a jar of clear water).

Monofilament

Softer, or more supple.
Stretches More (more forgiving)
Less density (sinks slower)
Damaged by DEET insect repellent
Damaged by Ultra-violet light (sunlight)
Strength degrades by up to 40% in one year.
Less memory (straightens out easier)
Reflects more light (slightly easier to see)
Higher abrasion resistance

Fluorocarbon

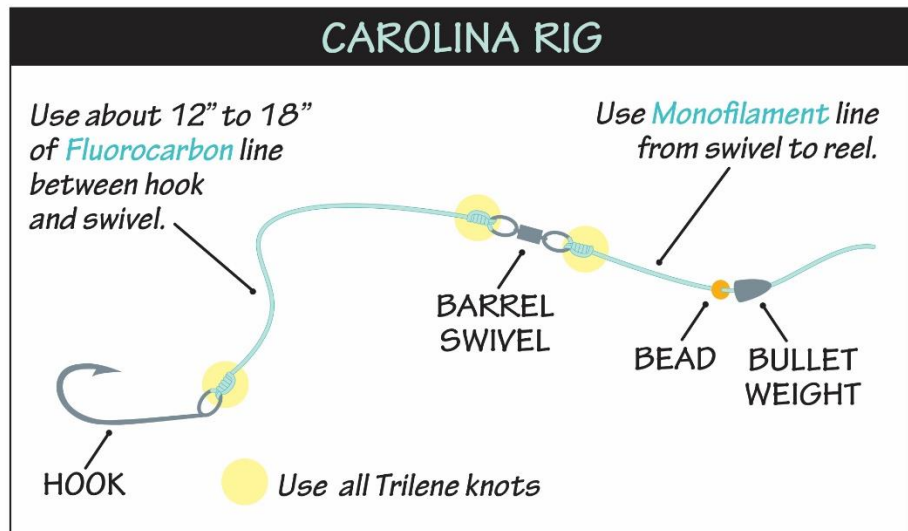
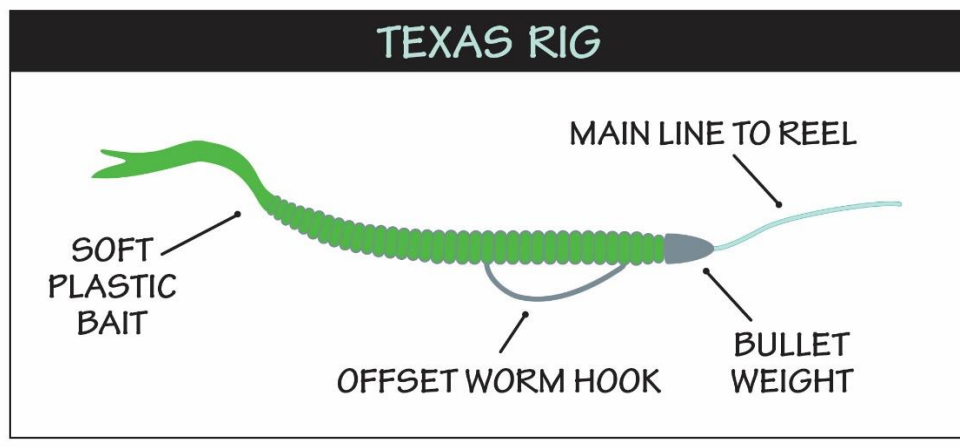
Stiffer to touch. "Wire-like" feel.
Very low stretch (faster hook sets)
More dense (faster sinking)
Not damaged by DEET insect repellent
Not damaged by Ultra-violet light.
Long shelf life. Strength unchanged in 3 years.
Higher memory (coils more stubborn off reel)
Reflects less light (more invisible under water)
Lower abrasion resistance (breaks when nicked)

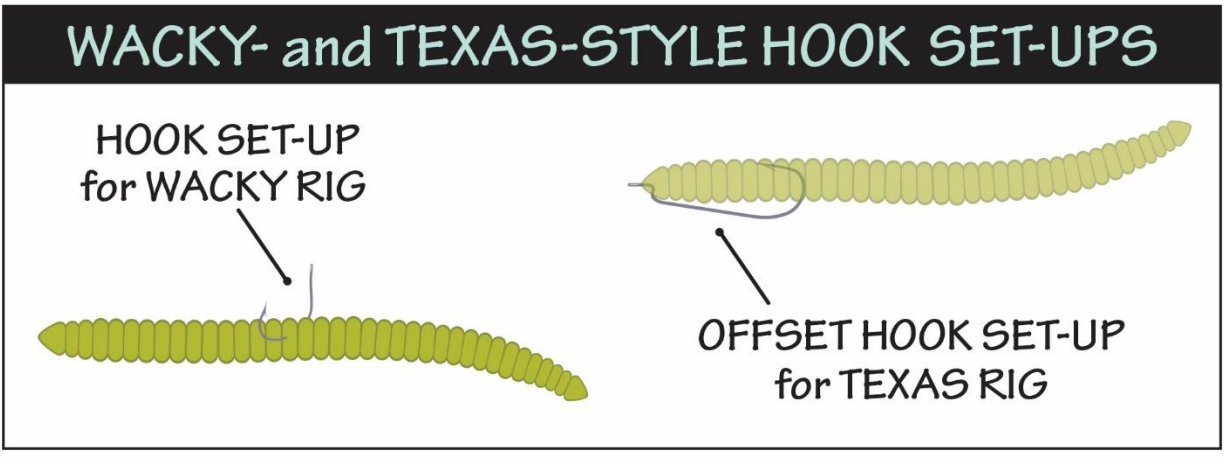
How could you accurately test which line type held a knot more securely?



Activity:

Soft plastic baits are extremely effective on catching largemouth bass. They simply look and act like live organisms to the carnivorous bass! Learn these different soft bait rigging techniques to present your baits in the water to try and match the real prey a bass is after. Hint: When fishing these plastic bait rigs, let the plastic bait sit still and work on its own. Then move it (reel) extremely slow and stop often.





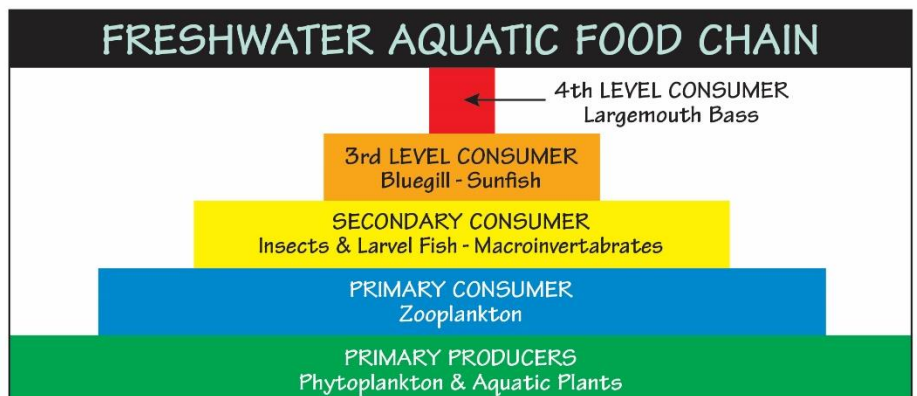
Lesson 4: Largemouth Bass Populations

Food Chain Fact: The higher an organism is in a food chain, they are generally larger in size but smaller in number.

Did you know sunlight is a key ingredient to growing a largemouth bass? The largemouth bass is a carnivore (an animal that eats flesh). It is a fierce predator high up in the aquatic food chain of the warm water lakes, ponds, and rivers of Illinois. But sunlight starts the food chain. Tiny plant nutrients in the water use sunlight to conduct photosynthesis (the process by which all green plants use the inputs of sunlight, carbon dioxide and water to produce the outputs of carbon and oxygen) and the growth of tiny aquatic plants occur. These tiny plants are called algae. Algae serves as food for microscopic animals (plant eating herbivores) which become forage for larger animals such as insect larve. These larger animals are big enough to be seen without a microscope and they are called macroinvertebrates.

So a bass fisherman needs to know....

Bluegill eat macroinvertebrates and largemouth bass eat bluegill. Adult bluegill are smaller than adult bass; but there are more bluegill than largemouth bass in a balanced aquatic ecosystem. Yes, there is science behind the rules of stocking rates and laws regarding size and creel limits of largemouth bass.



Stocking Rates: The typical lake or pond of average fertility in Illinois initially receives a stocking of largemouth bass/channel catfish/bluegill in a ratio of 80/80/700 ratio. That means a balanced

predator/prey relationship between largemouth bass/bluegill of almost 1:10! Ten bluegill for every bass.

Harvesting Fish - Best Practices: The single biggest mistake made in fish management is harvesting too many largemouth bass. Focus on keeping bluegill to eat and release largemouth bass unharmed, especially bass under 14 inches in length. Large bass aren't as desirable for human consumption anyway and as an important predator to the ecosystem (keeping bluegill populations in check) focus on eating bluegill. Site specific rules and regulations on fish size and creel limits must be known by the fisherman! These are made for a reason!

Fisheries Quiz: A typical one acre pond (about the size of a football field) should have 4 pounds of bluegill for every 1 pound of largemouth bass. The pond can and should have 80 pounds of bluegill harvested each year to keep the bluegill numbers in control. What is the maximum limit on how many pounds of bass should be harvested that same year?

Activity:

Time to catch, keep, and clean some bluegill!

Catching bluegill with a rod and reel is relatively simple and good for your future bass fishing opportunities as well. Remember to use small hooks (size 8-12 hook); light line (4-6 lb. line); and live bait (catching your own bait using a net or finding worms under rocks/logs is fun). Keep your fish alive or ice them down quickly for best flavor. Learn your filleting techniques by watching this video:

https://go.illinois.edu/bluegill_fillet

Lesson 5: Temperature and Eyesight Factors in Bass Fishing:

A bass is called "cold blooded" because it does not regulate its internal body temperature like a human. Therefore, a bass is the same temperature as the water it lives in! This means in cold water, the bass needs less energy to survive – thus it doesn't need to eat as often as when it is warmer. To a fisherman, this means bass feed more when the water temperatures are rising – as they are in the spring in Illinois. In April, a sunny spot will likely produce more bites than a shady spot as the water is warmer in the sun.

The color of the water too has an effect water temperatures. Muddy water absorbs heat from the sun faster than clear water. But can the bass see its prey in muddy water? Let's find out!

Scientific research proves that bass do indeed see some colors well but not others. Like humans, bass have eyes that contain rod cells and cone cells. Rod cells detect motion in low light and cone cells determine colors in brighter light. Humans have *three* kinds of cones (Red, Green, and Blue) but bass only have *two* kinds of cones (Red and Green). However, bass have twice as many red cones than green cones.

Bass can see the color red the best, then green fairly well. After that, bass see most dark colors such as blue, brown, and purple are all seen as black. Very bright colors such as yellow, light blue, and silver are also seen similar to a bass – as white.

Activity: Water Clarity and Water Temperatures in Bright Light

Find 2 small, identical drinking cups and put 2 ounces of drinking water in each. Water at room temperature works best for this experiment. Leave the water in one cup clear, but in a second cup put 1 drop of red; 1 drop of blue; and 1 drop of green food coloring to make the water dark.

Place both cups beneath a clamp-on style shop lamp with an incandescent light bulb (100 watt bulb preferred) and measure the temperatures of each at 5 minute intervals with a thermometer for at least 30 minutes. The type of thermometer that measures food temperatures work well. Take at least 4 temperature readings for each cup. Graph your results. Which liquid absorbed the heat from the bulb the fastest? Which liquid got hotter? What would you anticipate happening if you increased the amount of food coloring in the second cup (i.e. 5 drops of red; 5 drops of blue; and 5 drops of green)? Would the water heat up even quicker if it were darker?

Where might a cold blooded largemouth bass be in the early spring when the shallow water is muddy from a hard rain and the sun has come out bright on the day you get to go fishing? Yep...that bass is warming itself in the warmer, muddy, shallow water at that time. And a warm bass is a hungry bass!

Lesson 6: Spin Cast vs. Spinning Rods

A skilled fisherman is like any skilled craftsman – they know how to select the right tool for the task at hand. A push button spin cast outfit is typically the fishing rod selected for beginners because it is quick, simple, and easy to use. However, compared to spinning gear, push-button spin cast gear does not offer the balance, sensitivity, and finesse needed to maximize the effectiveness of fishing with more advanced techniques. The balance comes from the reel hanging beneath the rod, along with the unimpeded flow of line from the reel when the bail is open.



Spin Cast Rod and Reel



Spinning Rod and Reel

Spinning reels can cast lighter baits than spin cast reels, as the line has less friction leaving the reel. To aid the angler in throwing light lures, the spinning rod itself is designed to be longer than a spin cast rod. The spinning rod handle is also longer behind the point of where the reel is mounted as that changes the dynamics of this lever. That's right...a fishing rod is a lever.

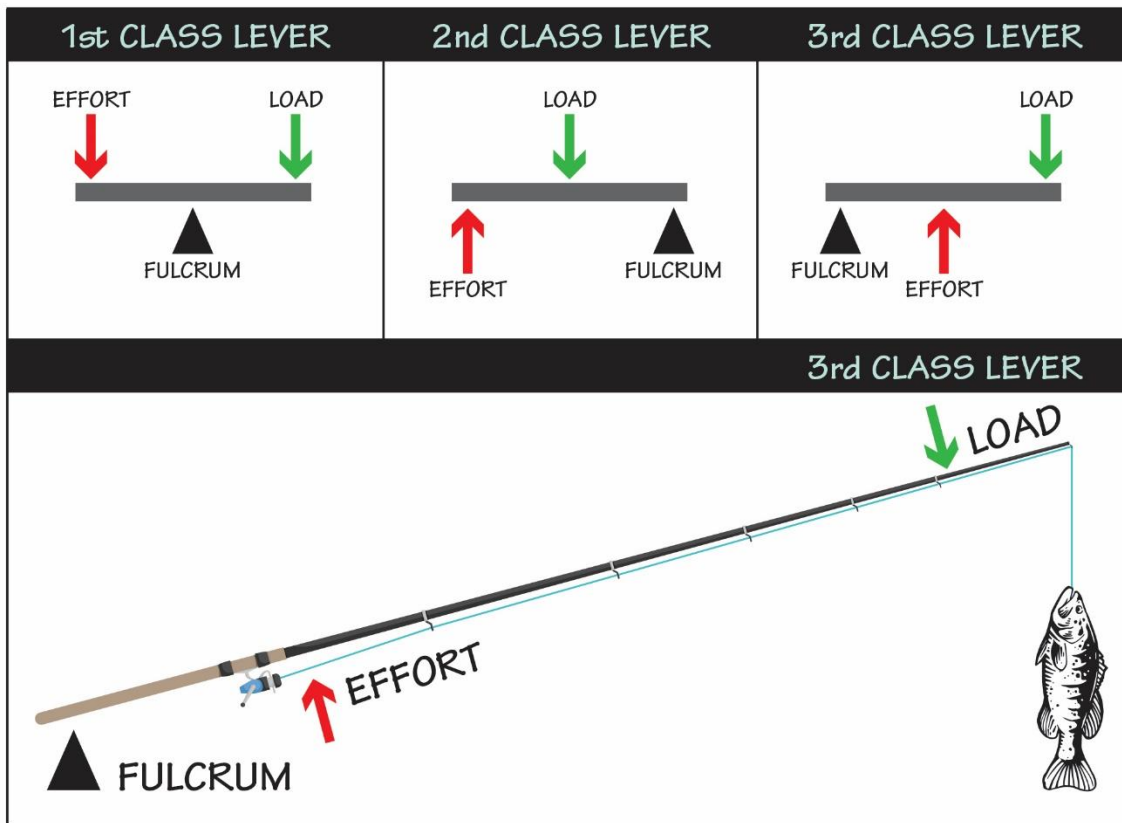
Activity: Fishing Rods are Levers

PARTS OF A LEVER

Fulcrum: Point at which the lever pivots

Effort Arm: Distance from fulcrum to point where force is applied.

Load Arm: Distance from fulcrum point to where load is applied



This activity will demonstrate differences in effort arm power when levers of different arm lengths and fulcrum points are compared.

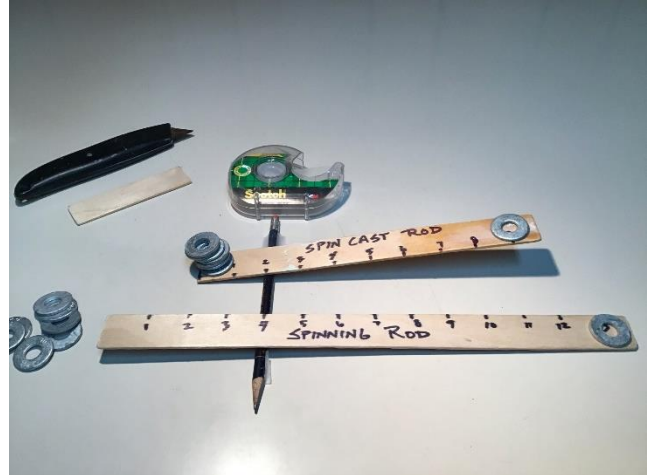
Materials Needed: Two paint bucket stir sticks; round pencil; tape; ruler; utility knife; approximately 24 pennies or washers all of the same weight.

Step 1: Establish your fulcrum by taping the round pencil flat to table top so it won't move.

Step 2: Prepare your fishing rod levers:

Carefully use the utility knife to score and break 4 inches off one paint stir stick. This shorter stir stick will represent your spin cast rod. Leave your second stir stick full length. This longer stir stick will represent your spinning rod. Label your rods accordingly.

Place 1 inch marks on each stick by measuring with your ruler. Lay the sticks across the pencil with the spin cast rod (short stick) having two inches as a fulcrum point and the spinning rod (long stick) with 4 inches as its fulcrum point. These differing fulcrum points represent where your reel is mounted to your rod!



Step 3: Leverage and Fulcrum Points – The power needed to land your fish.

Place one coin or one washer on the long end of your rod. This is the “load arm” – or the fish on your line! Now place coins or washers one at a time on the opposite end of your rod – this is where you’d be holding the rod while reeling in your fish – the “effort arm”. Count how many coins or washers it takes for you to lift up the single weight (your fish).

Which rod took more coins to pivot the lever on your fulcrum? How do you think the effort needed would change with fishing rods of different lengths and different degrees of flexibility in the rod itself?

