



## Science of Summer Family Activities

### Fly Fishing 101

#### Overview

Fly fishing is part art, part science. There are many fascinating components, and you could spend the entire summer researching the science behind the sport and practicing skills on water and land. You can study fly-hatching timetables, learn about different fish species in your region, and practice your casting skills in your backyard or local park. Rainy days are a perfect time to perfect your knot tying skills.

If you're new to the sport, see the links at the end of this section for tips on how to get started. With fly fishing you'll be so focused on finding fish and having fun in the sun, you won't even know how much science you're soaking up at the same time.

#### Materials

These comprehensive fly fishing outfits provide everything a beginner angler needs to get started in the sport. Each kit includes:

- 4-piece carbon fiber fly rod
- Concept Fly Reel
- floating fly line
- leader and backing
- fly box with flies
- instructional fly fishing video

The 3M Company's Scientific Anglers™ website outlines all the equipment and accessories you need for fly fishing. It offers a full range of gear and also has a line selector application to help you choose the best line to suit your fishing needs. Beginners might want to purchase a kit like the one above.

<http://www.scientificanglers.com/>

## Terminology

- **Fly** - an artificial lure designed to look like a real aquatic insect (like a mayfly or a midge); hand-tied with different natural and synthetic materials tied on hooks
- **Fly Line** – fishing line designed specifically for fly fishing
- **Hatch** - a large number of (real) flies of the same species; hatch charts show which types of bugs and insects hatch when and where; anglers try to “match the hatch” with their artificial flies
- **Leader** - the section of line between the fly line and the fly; usually tapered, to deliver the fly softly and away from the fly line
- **Fly Reel** – holds the fly line, coils line to prevent tangling, and “reels” fish in
- **Fly Rod** -a type of fishing rod especially designed to cast a fly line; the reel attaches at the butt of the rod with the rod handle always above the reel
- **Tippet** - the end section of a tapered leader; the smallest diameter section of a tapered leader; the fly is tied onto the tippet
- **Streamer** – fish-shaped fly; tied to imitate types of baitfish preferred by game fish

## Activities

### **The Science Behind Fly Fishing**

- Teachable moments abound in fly fishing. In addition to practical life skills, there’s the physics behind casting; the biology of insects, fish and fish behavior; the science of water currents, depths and barometric pressure.
- There are many variables in fly fishing, most of them depending on type of fish and type of water. It is hard to generalize about slow water vs. fast water. For instance, trout are often found where fast water meets slow water, deep water meets shallow water, in pockets before and after rocks, and in riffles (also known as rapids). Over time you’ll see how a floating line reacts in a variety of situations and learn how to “read the water” like the pros.
- When barometric pressure rises, indicating good weather, fish tend to swim near the surface. When the pressure drops, indicating stormy weather, fish veer towards deeper water
- Time of day is an important factor, too. Aim for very early and very late in the day, as fish avoid sunlight. Since fish are cold-blooded, they slow down during the day when the water is warmest.
- Once you learn the basics, there are endless fine points to study. How do you adjust for slower or faster water? Does line diameter really make a difference? What about the weight of the fly?
- The science links at the end of this section offer a range of useful facts and resources.

## **Learn to tie knots**

- Knots are a critical part of fly fishing. Many beginners lose fish due to poorly tied knots. Anglers use different knots for different purposes. You need the right knot for the right job, and you need to tie it the right way. Some common knots include
  - Clinch knot – attaches leader to fly
  - Skip knot – attaches backing to reel
  - Nail knot – connects backing to fly line and fly line to leader
  - Surgeon's knot – used for making leaders and adding tippet
  - Loop knot – used for tying on streamers
  - Perfection loop – used for loop-to-loop connections
  - Albright knot - used for tying the backing to fly line

Spend time practicing your knot-tying on dry land, before you go fishing. Refer to the links below to find illustrated and animated step-by-step guides to teach yourself the knots you need.

## **Learn to tie your own flies**

- There are thousands of different fly patterns, most designed to look like fish bait or bugs. Bug-style “flies” imitate specific insects like midges and streamers that hatch at certain times in different regions. Others types of flies are just designed with bright colors and other features to look enticing to fish. Some flies float on the water, while others are designed to sink partially or completely.
- Visit a local fly shop or sporting goods store to check out the range of sizes, colors and patterns and ask what types are recommended for your region. Fly sizes are based on the size of the hook (the smaller the number, the larger the fly).
- You can also try making your own out of feathers, fur, hair, and an assortment of natural and synthetic materials. This is a good project for patient people who like detailed work!

## **Links**

Scientific Anglers™: Fly Fishing Instruction

<http://scientificanglers.com/plan-your-trip/fly-fishing-instruction>

The Best Videos of Catch Magazine

<http://www.scientificanglers.com/plan-your-trip/featured-video>

Fly Fishing for Beginners

<http://www.flyfishingforbeginners.com/index.html>

How To: Basics from Fly Fisherman Magazine

<http://www.flyfisherman.com/how-to/basics>

Find all you need to know about fishing and boating

<http://www.takemefishing.com>

Fly Fishing Research

<http://flyfishingresearch.net/home.html>

Fly Fishing Science Articles

<http://www.midcurrent.com/articles/science.aspx>

The Science of Fly-Fishing

<http://www.upress.virginia.edu/books/ulanski.html>

Use this basic calculator below to find the sink rate, rule number, and density of a fly line.

<http://flyfishingresearch.net/calcemyourself.html>

How to estimate the weight of a fish from its length and girth measurements

<http://flyfishingresearch.net/fishweight/weightestimatortable.html>

## **Knots**

Knot Tying Basics

<http://www.scientificanglers.com/plan-your-trip/fly-fishing-instruction/knot-tying-basics>

Animated Knots by Grog

<http://www.animatedknots.com/indexfishing.php>

## **Flies**

How to Tie Flies & Fly Tying: E-how Video Series

[http://www.ehow.com/videos-on\\_1700\\_tie-flies-fly-tying.html](http://www.ehow.com/videos-on_1700_tie-flies-fly-tying.html)

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