



## Introduction to Fly Tying Materials

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### Objectives:

Participating young people and adults will:

1. Identify some common fly tying materials
2. Identify sources for the materials displayed
3. Identify local and catalog sources of supply
4. Relate materials to possible uses
5. Have fun while learning

### Youth Development Objectives

Participating young people will:

1. Enhance consumer decision making skills
2. Enhance interests in science and education
3. Enhance communication skills
4. Expand relationships with adults and teens

### Roles for Teen and Junior Leaders

1. Assist in set up and clean up of teaching site
2. Pass out materials and explain their uses
3. Monitor materials as they are passed around
4. Discuss uses of materials and sources for them
5. Discuss personal experiences with the materials

### Potential Parental Involvement

1. See "Roles for Teen and Junior Leaders" above
2. Arrange for or provide teaching location
3. Arrange for or provide tying materials
4. Arrange for or provide transportation

**Best Time:** Any time as appropriate for a beginning or intermediate fly tier

**Best Location:** Classroom or workroom setting, well-lighted and comfortable with large tables

**Time Required:** 60 to 90 minutes

### Equipment/Materials

Thread head cement

Chenille yarns

floss

hooks

hackle feathers: hen and rooster, neck and saddles - colors as desired, loose and on capes

quills: duck, goose, turkey, peacock, pheasant, grouse, others as desired, loose and on wings

pheasant: ringneck, golden, silver, Amherst tippets, capes, body feathers, tails partridge and grouse hackles peacock herl, sword, wing quills

turkey: secondaries, tail, body feathers

marabou duck flank: wood duck, mallard, teal, others

spinning hair: deer, caribou, antelope, elk

rabbit: fur, mask

bear: black, brown, polar

tails: bucktail, calf, fox, mink, fitch, fox,

ermine, skunk, woodchuck, others

dubbing fur: squirrel, red fox, beaver, badger,

mink, mole, muskrat, otter, opossum, rabbit,

raccoon, skunk, angora goat, others

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5. Arrange for or provide refreshments
6. Discuss personal experiences with materials/sources

moose mane  
 porcupine quills  
 tinsel  
 flash tinsel  
 flash fiber  
 Antron polypropylene fish hair  
 artificial hair  
 polypropylene wing material  
 ice chenille  
 suwannundaze lite brite  
 mylar piping craft fur  
 larva lace  
 lead eyes  
 brass beads  
 your ideas

### Evaluation Activities/Suggestions

1. Observe questions and interest of the participants
2. Observe ability to identify materials
3. Observe interactions with adult and teen leaders
4. Observe performance on decision making exercises

### References

### Safety Considerations

Although relatively rare, some youth may have allergies to some fly tying materials. Treated materials may have toxic chemicals as residues from tanning, curing or coloring them. Some will have traces of noxious materials for moth control or control of beetle larvae. Advise young people to wash their hands after handling the materials and before eating or drinking.

### Lesson Outline

Author's note: An accomplished, local fly tier can be an outstanding resource in this presentation. He or she will usually have a wide variety of materials and are a great source for tips and techniques. Check with local fly shops, tackle stores, sportsman's groups, or local chapters of organizations like Trout Unlimited or The Federation of Fly Fishers. Be sure to control the context and level of information. Too much information at an early stage can be detrimental to learning and continued activity in the project. This lesson may be divided into beginning (just the basics) and intermediate (some detail added) lessons to avoid confusion at the start of a tying session.

#### Presentation

#### Application

#### I. Hooks

##### A. Many sizes and styles

1. Hook size based on gap width
  - a. Larger number -smaller hook
  - b. Size 28 smallest commonly used
  - c. Larger than size 1
    - 1) Increase size with number of "oughts"
    - 2) Written 1/0, 2/0, etc.

**EXHIBIT** and **EXPLAIN** the basic fly tying materials briefly as an orientation to them. **OUTLINE** sources of the materials both biologically and chemically and from the standpoint of sources of supply.

##### B. Shank length/wire size standard for size and style

1. Deviations indicated by X's
  - a. 2x long 2x fine
    - 1) Shank as long as 2 sizes larger hook
    - 2) Wire the size of 2 sizes smaller hook
    - 3) Large dry fly or hopper hook
  - b. 5 x short, 2x stout
    - 1) Shank length of hook 5 sizes smaller
    - 2) Wire size of hook 2 sizes larger
    - 3) Heavy egg fly or glow bug hook

**DISPLAY** a set of hooks from size 28 up to about 4/0 in several different types, bend and point styles, and gauges.

Use a very large hook to **ILLUSTRATE** the size, shank length, wire size and type or style of hook.

**USE** several hooks in the same style (e.g. model perfect) and size as examples of fine, stout, short and long shanks to **REINFORCE** the comments being made.

- 2. Sizes and lengths vary with pattern
- C. Many sizes, types and patterns
  - 1. Match pattern and size to use
  - 2. Match types to preference and use

**DISPLAY** several hook types to show differences in size, length and uses.

## II. Thread

- A. Sizes and uses
  - 1. Thread size
    - a. Increases within the alphabet
    - b. Decreases with number of 0's
    - c. 8/0 smallest - tiny flies
    - d. 6/0 standard for most tying
    - e. 3/0 or monocord for large flies
      - 1) Bulky flies needing pressure
      - 2) Spinning deer hair for bass bugs
    - f. Size A for largest flies
- B. Materials
  - 1. Silk - expensive and seldom used
  - 2. Nylon - most common material
    - a. Stretches slightly
    - b. Pressure can hold materials together
  - 3. Kevlar - very strong for its diameter
    - a. May cut some materials
    - b. Hard on scissors
    - c. Bullet-proof vest fiber
  - 4. Dyneema - spun gel fiber
    - a. Stronger than kevlar
    - b. Similar characteristics
- C. Colors and types
  - 1. Pre-waxed thread
    - a. Better tensile strength
    - b. Better handling characteristics
    - c. Aids in applying dubbing
  - 2. Many colors available
    - a. Black most commonly used
    - b. White for light patterns
    - c. Other colors as desired

**NOTE** that 8/0 means 00000000 and that the thread gauge is smaller with each 0 added. **EMPHASIZE** that an assortment of 6/0 and 3/0 or monocord is adequate for nearly all tying purposes.

**NOTE** that silk tends to rot if it is wet, and that nylon is generally preferred and much cheaper to purchase.

**DISCUSS** the newer synthetic threads and the need to use ceramic bobbins and cutting tools to handle them effectively. **NOTE** that damage to scissors is common when using these stronger fibers.

## III. Head cement

- A. Lacquer to finish head
  - 1. Clear most commonly used
  - 2. Colored lacquers used on some flies
- B. Several types
  - 1. Varnish type
  - 2. Vinyl cement type
  - 3. Water-based or solvent-based
  - 4. Clear nail polish works
- C. Purposes
  - 1. Keeping materials in place
  - 2. Oxidation and discoloration barrier
  - 3. Bonding thread in place
  - 4. Creating a shiny head
  - 5. Protecting painted eyes

**NOTE** that head cement has many uses, including covering lead underbodies to keep them from discoloring tying materials and binding the finished whip finish into the head.

**STRESS** the need for solvent to keep the cement at the proper thickness to apply easily, penetrate, and bond well.

## IV. Body materials

## A. Manufactured body materials

### 1. Chenille

- a. Fuzzy material on a thread core
- b. Absorbs water readily
- c. Many colors available
- d. Several sizes available
- e. Types
  - 1) Standard
  - 2) Flocked - extra fuzzy
  - 3) Variegated - two colors
  - 4) Tinsel core - sparkle chenille
  - 5) Ice chenille - flash colors
  - 6) Tinsel chenille - garland-like
- f. Uses
  - 1) Wet flies
  - 2) Some nymphs
  - 3) Steelhead and salmon patterns
  - 4) Some streamers and bucktails
  - 5) Bass and panfish flies

### 2. Yarn

- a. Natural fibers
  - 1) Wool
  - 2) Angora
  - 3) Mohair
- b. Artificial fibers
  - 1) Polypropylene
  - 2) Polyesters
  - 3) Acrylics
  - 4) Antron
- c. Wide variety of sizes and colors
- d. Uses
  - 1) Body materials
  - 2) Winging material
  - 3) Glo bugs

### 4. Floss

- a. Many materials
  - 1) Silk
  - 2) Nylon
  - 3) Acetate
- b. Sizes and types
  - 1) Single strand
  - 2) Double strand
  - 3) Four strand (heavy)
  - 4) Embroidery or cross stitch
- c. Many colors available and useful
- d. Used for smooth compact bodies

### 5. Tinsel and wire

- a. Metal or mylar most common
  - 1) Gold or silver most common
  - 2) Copper
  - 3) Many colors in mylar
- b. Types
  - 1) Flat (wide, medium, narrow)
  - 2) Oval (wound on thread core)
  - 3) Round (wound on thread core)

**LAY OUT** and assortment of fly tying materials on tables arranged with plenty of room around them on all sides. **LABEL** each group of materials and items within the group. **USE** large plastic bags with labels if necessary to ease handling of the materials by the participants. **ENCOURAGE** young people to circulate, view and handle all the materials after the brief introduction to them. **STATION** adults or teen leaders around the room to assist in interpreting what the materials are and how they are used in tying.

**ILLUSTRATE** the use of the materials with some flies that the young people may be tying in the course of the program.

**DISCUSS** the properties of the several types of yarns being show. **NOTE** that they can often be located relatively inexpensively in craft shops or fabric stores.

**DISPLAY** several types of floss useful to the fly dresser and **DISCUSS** their uses and selection.

**SHOW** a variety of tinsels and wire, including double sided mylar and wires that may be obtained from many sources. **NOTE** that fuse wire makes excellent lead wire for weighting flies.

- 4) Wire - drawn or extruded
- 5) Flash tinsel
  - a) Light and thin mylar
  - b) Accent or flash in patterns
- 6) Braided
- 7) Embossed -more facets for light
- 8) Piping (woven over thread core)
- c. Uses
  - 1) Body material
  - 2) Ribbing material
  - 3) Tags on some flies
  - 4) Flash or movement suggestion
- 6. Flash fibers
  - a. Several varieties available
  - b. Add sparkle to streamers and nymphs
  - c. Many colors available and useful
- 7. Latex, plastic and other synthetics
  - a. Suwannundaze - nymph bodies and ribs
  - b. Latex sheet - scud and shrimp backs
  - c. Larva Lace - nymph backs
  - d. Epoxy
    - 1) Shrimp and crab backs
    - 2) Head or body forms
  - e. Soft body materials
  - f. Curon - underbody materials
- 8. Felt and fur-like sheets
  - a. Crab, shrimp or crayfish patterns
  - b. Nymph bodies
- B. Natural body materials
  - 1. Dubbed fur
    - a. Many types and colors useful
    - b. Long or short under fur used
    - c. Some commonly used furs
      - 1) Red fox
        - a) Cream to ginger
        - b) Urine-burned pink
        - c) Pale brown
        - d) Relatively long, easy dubbing
      - 2) Gray fox - similar to red fox
      - 3) Muskrat
        - a) Pale to medium dun
        - b) Tan to brown overtones
        - c) Dyed colors available
        - d) Medium length, easy dubbing
      - 4) Mink and weasel
        - a) Natural light brown or white
        - b) Many dyed colors
        - c) Short to medium, moderate dubbing
      - 5) Raccoon
        - a) Dark chocolate to creamy tan
        - b) Medium to long, easy dubbing
      - 6) Opossum
        - a) Off white to creamy
        - b) Hard, glossy under fur
        - c) Excellent seal substitute

**DISPLAY** assorted flash fibers and synthetic materials used in fly tying.

**SHOW** examples of flies tied using these materials as illustrations.

**DISPLAY** an assortment of natural dubbing furs, hair and tails that can be useful to the fly dresser. In good light, have the participants attempt to **DESCRIBE** the colors they see or **ARRANGE** them in order of intensity and hue.

- d) Moderate to difficult dubbing
- 7) Rabbit fur and hare=s mask
  - a) Natural gray-brown and dyed colors
  - b) Fine, easily dubbed fur
  - c) Short, hard guard hairs on mask
- 8) Otter
  - a) Fine, tannish to gray fur
  - b) Extremely durable
  - c) Moderate to difficult dubbing
- 9) Beaver
  - a) Chocolate to tannish gray
  - b) Medium length, easy dubbing
  - c) Many dyed colors
- 10) Mole
  - a) Dark dun (Adams color)
  - b) Short, fine dubbing
  - c) Medium difficulty
- 11) Bison wool
  - a) Fiery brown, glassy
  - b) Long, moderately hard
  - c) Easy to moderate dubbing
- 12) Caribou
  - a) Tan to brownish
  - b) Very fine and long
  - c) Easy dubbing
  - d) Good binding fur for other fibers
- 13) Deer under fur - as above but shorter
- 14) Badger
  - a) Cream to tan with dark tips
  - b) Medium to long, easy dubbing
- 15) Skunk(s)
  - a) Blackish, dark gray to white
  - b) Medium to long, easy dubbing
- 16) Woodchuck (marmot)
  - a) Nearly black to brown
  - b) Moderate length and hard
  - c) Moderate to difficult dubbing
- 17) Bear
  - a) Black, cinnamon, white
  - b) Short to long, glassy
  - c) Moderate to difficult dubbing
- 18) Bobcat or lynx
  - a) Chocolate, tan, ginger, cream, white
  - b) Medium and fine
  - c) Easy to moderate dubbing
- 19) You find it - all furs useful
  - a) Best in fall and winter
  - b) Select for colors you need
- 2. Spun hair
  - a. Deer hair
    - 1) Whitetail
      - a) Northern- long, more flare
      - b) Southern - shorter, less flare
      - c) Color by location on deer
        - (1) Grayish tan

**DISCUSS** some ways of obtaining these materials aside from ordering them through a supply house.

**ILLUSTRATE** the behavior of several types of body hair by spinning or stacking it on a hook or a piece of stiff wire with loops on either end. **DISCUSS** the differences in them and their usefulness to the tier.

- (2) Tan to brown
    - (3) White to creamy
  - 2) Blacktail or mule deer
    - a) Darker gray
    - b) Finer texture
    - c) Flares easily
    - d) Gray to creamy and yellowish
  - b. Caribou or reindeer
    - 1) White to pale tan or gray
    - 2) Fine, soft and easily flared
    - 3) Under fur a bonus
    - 4) Choice for spun-hair dries
  - c. Elk or wapiti
    - 1) Chocolate or tan to creamy
    - 2) Short to medium, moderate flare
    - 3) Choice for elk hair caddis
  - d. Pronghorn or antelope
    - 1) Reddish tan to white
    - 2) Coarse, brittle, very easily flared
- 3. Wound hair
  - a. Porcupine quill
    - 1) Hollow with foamy filler
    - 2) Flattened and wound
    - 3) Bound as extended body
    - 4) Floats like cork
  - b. Moose mane
    - 1) Brown, tan, gray, whitish
    - 2) Coarse and tough
    - 3) Body material for tiny dries
  - c. Horse mane or tail
    - 1) Dense and glassy
    - 2) Brown, black, tan, white
    - 3) Body material or ribbing
- 4. Cork, balsa, foam or sponge
  - a. Popper or bug bodies
  - b. Crayfish components
  - c. Panfish bug or spider
- 5. Raffia
  - a. Cured grass
  - b. Tan or dyed colors
  - c. Many replacements available
- V. Wing, tail or hackle materials
  - A. Hackle feathers
    - 1. Neck hackles
      - a. Hen - soft, webby
      - b. Rooster - harder, free barbules
        - 1) Many grades
          - a) Premium
            - (1) Full range of sizes
            - (2) Excellent hackle quality
            - (3) Excellent length and quill quality
            - (4) Color quality uniform and true
            - (5) Relatively high cost
          - b) Dry fly
            - (1) Several grades

**ILLUSTRATE** the use of hair as a wrapped or wound body material.

**SHOW** some bugs or poppers made with these materials.

**DEMONSTRATE** the difference between neck and saddle hackles as well as the difference between hen hackle and cock hackle.

**DISCUSS** the differences between very high grade hackle and lower quality grades. **NOTE** that the less expensive hackle may be more useful for beginning fly tiers.

- (2) Variable size range
    - (3) Variable length and quill quality
  - c) Indian capes
    - (1) Modest quality in most
    - (2) Excellent bargain for many tiers
  - d) Bass or Chinese necks
    - (1) Longer, wider, webbier hackles
    - (2) Bass flies, streamers
- c. Availability
  - 1) Loose
  - 2) On cape
  - 3) Half capes
- 2. Saddle hackles and schlappen feathers
  - a. Longer feathers
  - b. Thin quill
  - c. Range of hackle quality
  - d. Uses
    - 1) Streamer wings
    - 2) Dry fly hackles
    - 3) Tailing material
  - e. Availability
    - 1) Saddle patches or halves
    - 2) Loose hackles
    - 3) Strung hackles
- 3. Body hackle
  - a. Soft hackles for wets and nymphs
  - b. Primarily game bird body feathers
  - c. Wing pads and nymph legs
  - d. Availability
    - 1) Loose hackles
    - 2) Patches
    - 3) Capes or half capes
- B. Tail materials
  - 1. Hackle fibers
    - a. Soft for wets and nymphs
    - b. Stiff for dry flies
  - 2. Hackle points
    - a. Bivisible dries
    - b. Some nymphs - tails or gills
  - 3. Hair
    - a. Bucktail
    - b. Calf tail
    - c. Guard hairs of appropriate color
  - 4. Waterfowl flank feathers
    - a. Nymph and wet fly tails
    - b. Soft, active tail materials
  - 5. Hackle feathers
    - a. Saltwater streamers
    - b. Bass or panfish bugs
- C. Wing materials
  - 1. Waterfowl flank feathers
    - a. Clumped wings
    - b. Most commonly used
      - 1) Wood duck
      - 2) Mallard

**SHOW** capes or loose hackle from game birds to illustrate the source and use of body hackle.

**DISCUSS** winging and tailing materials broadly, using tied flies to **ILLUSTRATE** your points.

- 3) Teal
- 4) Pintail
- c. Others useful
- 2. Turkey body feathers
  - a. Clumped wing no-hackle dries
  - b. Parachute patterns
- 3. Wing quills
  - a. Quill winged wets and dries
  - b. Some streamers - e.g. Muddler Minnow
  - c. Nymph wing pads
  - d. Many quills useful
    - 1) Duck quills an coverts
    - 2) Game bird quills and coverts
    - 3) Turkey quills
    - 4) Goose quills
- 4. Guard hair
  - a. Bucktail
  - b. Bear hair
  - c. Mink, fitch or ermine
  - d. Woodchuck tail or guard hairs
  - e. Calf tail (kip or impali)
  - f. Others of appropriate color
- 5. Marabou
  - a. Lively, active wing material
  - b. Primarily streamers
  - c. Gills and emerging wings on nymphs
- 6. Peacock herl or sword
- 7. Yarn, floss or fur
- 8. Ostrich, rhea or emu herl
- 9. Flash tinsel, flash fiber

**DEMONSTRATE** the action of marabou by blowing on a large feather and letting it move in the air stream. **NOTE** that it often is tied so the dressing appears very heavy, but that it reduces in size substantially once it is wet.

#### D. Hackle colors

- 1. Dyed colors standardized in most cases
- 2. Natural colors
  - a. White
  - b. Cream - yellowish white
  - c. Pale watery dun - very pale grayish white
  - d. Light ginger - straw to pale golden tan
  - e. Ginger - golden tan
  - f. Brown - deep tan to medium brown
  - g. Coachman brown - reddish dark brown
  - h. Bronze blue dun - pale blueish gray with bronze highlights
  - i. Blue dun - medium bluish gray
  - j. Dark blue dun - thunder cloud bluish gray
  - k. Iron blue dun - dun with brownish cast
  - l. Badger - white to golden with dark center stripe
  - m. Furnace - ginger to brown with dark center stripe and dark tips
  - n. Grizzly - white with black barring
  - o. Red grizzly - white with coachman barring
  - p. Ginger grizzly - white with ginger

Have participants attempt to **ARRANGE** the hackle capes in order of their hue and intensity from the lightest to the darkest colors used.

- barring
- q. Cree - white with red and black barring
- r. Straw - very pale amber or ginger
- s. Splash - pale dun with darker patches

## VI. Other materials

### A. Eyes

1. Dumbbell eyes
2. Molded eyes
3. Prismatic eyes
4. Lacquer eyes

### B. Dyes and colorants

1. Fabric dyes for hackle and fur
2. Permanent markers for other materials

### C. Whatever you can bind or wrap on a hook

**NOTE** that anything that can be tied, glued, wrapped or wound on a hook can become fly tying material. **ENCOURAGE** young people to use their imaginations to locate potential materials for their patterns.

## Summary Activity

Fly tying materials cover a broad, diverse, and personal part of every fly tier's possessions. Encourage a swap meet on ways to acquire the materials used (legally), unique uses, ways of preparing or preserving the materials, local sources of supply like craft shops, taxidermists, hunters, trappers, road kills, or even combing the family cat or dog. Be prepared to moderate an open discussion and sharing of fly tying background as an introduction to this part of the fly-fishing culture.

## Lesson Narrative

### Hooks

Hooks come in a vast array of sizes and styles. In any given style, the size is based upon the width of the gap - the distance between the shank and the point of the hook. In general, the larger the number on the hook size, the smaller the hook. The smallest hooks in common use are generally size 28 dry fly hooks. Most companies go up in size by twos until they reach about size 4, then increase one size at a time. Hooks larger than a size 1 or #1 are referenced by the number of oughts or zeros - 1/0, 2/0 etc. with most patterns using hooks smaller than 6/0.

Every size and style of hook has a standard wire gauge or size and a standard shank length. Deviations from that standard are indicated by "x's," "ex's," or the term "extra" after the size with additional information telling you what those mean. For example, a size 12 2x long, 2x fine hook is one that has a shank length of a hook in that style two sizes larger and a wire gauge of a hook two sizes smaller. In other words, the hook would be the length of a standard size 10 with the wire size of a standard size 14 in that style. This might be used in tying a grasshopper imitation or a very large mayfly or stonefly. On the other hand, a size 12 5ex short, 2extra stout hook would have the shank length of a size 17 hook and the wire gauge of a size 10. This would be a heavy egg fly or glow bug hook.

Hook sizes and lengths vary with pattern or style. In some types of hooks the sizes seem to be quite similar. In others, they may be radically different. One Messler style hook by Mustad, for example, in size 32, is approximately the size of their size 2 dry fly hook. Tiers match the pattern and the size to the uses they plan to make of the hooks in their patterns. A good assortment of hooks from short shanked spider or glow bug hooks to 6x long streamer hooks will be found on most tying benches.

### Thread

Fly tying thread is another of the fundamentals. Thread sizes follow fabric standards. Larger diameter threads are designated by alphabetical labels. Diameter increases from A toward E and beyond. These sizes are seldom used in fly tying except as ribbing material, but they are used in rod building. As the thread size decreases from size A, it is designated by oughts, with size decreasing with their number. Thus 00 or 2/0 thread is substantially larger than 000000 or 6/0 thread. The smallest thread in common use is 8/0, for tiny flies that require minimal thread pressure. The general standard for most flies is 6/0. For bulky flies or those requiring a substantial amount of pressure on the thread, many tiers prefer 2/0, 3/0, monocord or similar threads.

Thread materials have changed dramatically. Years ago, the standard tying thread was silk. It was very strong for

its diameter, stretched very little in use, and had a pleasing sheen when applied. On the down side, it tended to rot when it got wet; and it was quite expensive. The invention of nylon caused a gradual shift away from silk by most tiers. Some complained that it stretched in use, and that they could not get the good, tight ties when using the techniques they had employed with silk. Others noted that the stretch in nylon was an advantage, permitting the tier to exert more pressure and to hold it through the tying operation. Nylon had the advantage of being less expensive and much more durable than silk in contact with the water. Continuing research in polymer chemistry has produced some additional fibers for fly tying. Kevlar, the fabric used in body armor, is extremely strong, low stretch material. It is hard on scissors because of the hardness of the fiber, but it is very strong for its diameter. A new fiber, a gel-spun polypropylene with great strength used in bow strings yields a super strong thread for its diameter, Dyneema. It is much like Kevlar in characteristics of strength and low stretch. Unlike Kevlar, it does not fatigue under repeated stress. Both products should be used with ceramic bobbins and scissors to reduce wear and damage to the tools.

Tying threads come in a wide variety of colors and types, often with proprietary names or claims. In general, pre-waxed threads are preferred. They have somewhat higher tensile strength, better handling characteristics, and better tackiness for applying dubbing materials. Although there are many colors available from white to black and fluorescent colors as well, most tying can be done with black or white thread. Some patterns may call for scarlet or primrose or pale orange, but they can be tied with other colors as well. Start with black and white, and get the others when you feel you have a need for them.

### **Head Cement**

Head cement is simply a lacquer that penetrates the thread on the fly, binding it together to make it more durable under the influence of casting and contact with fish teeth. Clear head cement is the most commonly used, but colored lacquers are available as well, and some patterns call for their use. Some head cements are basically thinned varnishes. Others are based on vinyl cement. Still others use a water-based formula that leaves a permanent varnish on the head when it dries. Clear nail polish is used by many folks with success.

Anything that penetrates the thread to keep materials in place, forms a waterproof barrier to prevent oxidation and discoloration of the fly, creates a smooth-surfaced, glossy head, and offers protection of eyes or other materials under it will work. Experiment with those on the market and others you find on hand to see which ones you prefer. On any head cement, however, it is vitally important to keep it thinned to the proper consistency. Having the proper solvent greatly improves performance. Properly thinned head cement forms drops on the bodkin, but runs or drips readily. When it starts to form large droplets, it is time for some thinner. If it runs off without allowing a small droplet to form on the tip of the bodkin, it needs to be left open for a short time to let some solvent evaporate off.

### **Body Materials**

Body materials encompasses a huge array of natural and manufactured materials B fur, hair, feather fibers, chenille, floss, acetate, plastics, latex, tinsel, tinsel marabou, flash fibers, and much more. These may be dubbed, i.e. spun on the thread and applied to the fly, or wound on the body.

**Chenille** - Chenille is a fuzzy material consisting of fibers captured in a thread core. It is available in a wide array of colors and in several sizes. Chenille absorbs water readily, making it a good choice for wet flies, streamers and some saltwater patterns. It is generally available to fly dressers in fine, medium and large diameters. Standard chenille is bulky, but can usually be seen through for translucency. Vernille (ultra chenille) is more densely packed with fibers and forms a denser body that will not come apart as readily as the original type. Both types are available in single solid colors or is a selection of variegated, contrasting colors. Sparkle chenille has a strand of tinsel twisted into the core fibers, creating a bit of flash as well as the color. Ice chenille or cactus chenille has flash fibers or tinsel marabou twisted into the core, producing tremendous amounts of flash and action. Tinsel chenille is like miniature Christmas garland, with tinsel bound into the thread core.

Chenille is used in wet flies, some nymphs, steelhead and salmon patterns, some streamers and bucktails, many bass and panfish patterns, and a number of saltwater patterns. The tinsel chenilles are used in marabou muddlers and similar patterns, while cactus or ice chenille is featured in the Golden Fleece and in some shrimp patterns.

**Yarn** - Yarn is simply a spun or stranded fiber of some size. It can be composed of natural fibers, like wool, angora,

mo hair, or long underfur from bison or musk ox; or it can be composed of artificial fibers like polypropylene, polyester, acrylics, antron, dacron, or others. It can also be a blend or mixture of those fibers. Yarns are available in a tremendous variety of sizes and colors, from the fluorescent ropes used as hair adornments to earth toned crewel yarn. Yarns can be used as body materials, either wound or dubbed in place. They may be bound on and trimmed to shape to form merkins (crab imitations) or glo bugs, or they can be used as winging materials for dry flies (polypropylene) or streamers, like Kevin's Poly Minnow. They can also be used as tails or bits of color at the throat of streamers.

**Floss** - Floss is available in many types. Embroidery floss is often cotton or cotton blends with a slight twist. Most fly tying flosses are made from silk, untwisted nylon, or acetate. It can be had in single strand, two strand or four strand types from many fly tying supply houses. Four strand floss is often referenced as heavy floss in the fly tying catalogs. Since the strands are easily separated, the heavier floss is preferred for most purposes. Floss finds many uses on the fly tying bench, but its major use is in building smooth, compact bodies. It is available in a vast array of colors.

**Tinsel and Wire** - Tinsel and wire are also very common components of flies. Lead wire is often used to add weight to flies that are going to be fished in strong currents or deep water. Other wires may be used to provide weight or to add strength and definition to bodies.

Metal or mylar tinsels are the most commonly used materials of this type. While gold and silver are the most commonly used (in fact some mylar tinsels come gold on one side and silver on the other), copper, pearl, and many other colors are useful.

These products come in many types. Flat tinsel is readily available in narrow, medium and wide widths on cards or spools. It may be smooth or embossed to give a bit more flash in the water. Oval or round tinsel (tinsel wound around a thread core) is also available in multiple sizes. Wire is drawn or extruded to hair-like thicknesses or to heavier gauges that can be used to add weight to patterns. Flash tinsel or tinsel marabou is made of light, thin mylar. It is extremely active in the water. Tinsel is also available in braided form or as piping in many colors. These materials are used primarily as body materials, ribbing or tags. The marabou varieties (e.g. Flashabou) are used to add flash, movement and apparent life to the flies on which it is used.

**Flash Fibers** - Several varieties of flash fibers are available to fly dressers. These fibers have the appearance of a string of tiny lights that add sparkle and life to streamers and nymphs. A wide array of colors are available, and all of them are useful in at least some patterns.

**Latex, Plastic and Other Synthetics** - Many types of man-made materials find their way onto the fly tying bench. Suwannundaze was one of the earliest materials made available for tying realistic nymph bodies. An oval plastic material, it could simulate the segmented bodies of large nymphs quite well. Larva Lace is a round, tubular product developed more recently for the same purpose. Most tiers use it in weaving bodies on large stonefly nymphs or similar applications. Latex sheets or plastic strips are used in tying the backs of scuds or shrimp patterns. Various types of epoxy (primarily the clear, quick setting types) are used in building heads or body forms for some flies, or in making shrimp or crab backs more realistic. An assortment of other synthetics are out there to make soft bodies. These are primarily silicone cement or caulk based products, although new ones are appearing frequently. Curon foam, the soft stuff packed around electronics, makes an excellent underbody with a very live feel. It can be cut to shape for superior smelt or alewife patterns with mylar piping overbodies.

**Felt or Fur-like Materials** - Several companies offer felt-like or felted fur-like materials to be used in tying crab, shrimp, crayfish or crustacean patterns. They are also useful for large nymph bodies. One brand even has hook and loop tape to help the angler make instant crabs.

**Natural Body Materials** - Natural body materials are also extremely diverse. Dubbed fur is one of the oldest and most useful of all tying materials. Particularly when it becomes a bit picked out from use, this material becomes translucent, giving the appearance of living insects. All sorts of fur, both natural and dyed are used, including both long and short under fur, and mixtures of fur and guard hairs. A selection of commonly used furs is included here.

**Red Fox** - Red fox belly fur ranges from creamy white to amber and light ginger. Female foxes frequently have a small patch of “urine-burned pink” fur as well. This nearly white fur is called for in the Hendrickson dry fly as tied by Art Flick. The fur on the flanks ranges from pale brown to gray brown. Red fox fur is relatively long and easy to dub on the thread.

**Gray Fox** - Gray fox fur is very similar in most characteristics to red fox. Gray foxes have more rusty brown or rusty gray dubbing fur, and they supply some that is nearly dark ginger on their legs. The base of the tail has excellent but coarse amber dubbing.

**Muskrat** - Muskrat underfur is pale to medium blue dun with tan to brown overtones. It is available in many dyed colors as well. Muskrat fur is of medium length and easily dubbed.

**Mink and Weasel** - Mink and weasel (summer) have glossy light brown to dark brown under fur, with weasel fur being white to pale creamy in the winter. The fur is short to medium length and moderate in ease of dubbing. Adding the guard hairs to the fur produces a rough dubbing with sparkling brilliance.

**Raccoon** - Raccoon fur ranges from a creamy tan or dark amber to dark chocolate. The fur ranges from medium to long, and it dubs very easily. Tail fur is somewhat more crinkled and coarse than body fur.

**Opossum** - Opossum fur is very translucent, almost glass-like in some cases. It is hard and glossy with colors from off white to creamy. Some opossum fur has dark tips that range from gray to nearly black or chocolate in color. An excellent seal substitute, opossum fur is moderate to difficult to dub because of its hard texture.

**Rabbit Fur and Hare’s Mask** - Rabbit fur and hare’s mask are gray-brown in the natural state, but available in almost any color as dyed fur. The fur has a fine texture and is very easily dubbed, even when the guard hairs are included. Hare’s mask hairs are included to create the Gold-ribbed Hare’s Ear series of flies.

**Otter** - Otter fur is extremely durable, light tan to gray fur with lots of gloss. The guard hairs are extremely hard, glossy and short. The fur is relatively short and moderate to difficult to dub.

**Beaver** - Beaver fur ranges from a tan-gray to light chocolate brown with glossy guard hairs. The fur is medium length and easily dubbed. It can be found in a wide array of colors beyond its natural colors.

**Mole** - Mole fur is a dark, smoky blue dun, ideal for the Adams dry fly. The fur is short, soft and very fine, making it moderately difficult to dub, but yielding tight bodies when dubbing is mastered.

**Bison** - Bison wool ranges from pale glassy brown to a bright fiery brown. The wool is long and moderately hard, yielding the shiny appearance. It is easy to moderate in dubbing ease.

**Caribou** - Caribou under fur is very pale tan to brownish. It is long and very fine, making among the easiest of furs to dub. Its pale color makes it an excellent carrier fur for others that are hard to dub, allowing the tier to bind them in place with the caribou fur as a carrier. Deer under fur is a bit lighter and shorter, but it shares the characteristics of caribou.

**Badger** - Badger fur is creamy to tan with dark tips. Medium to long, it dubs easily.

**Skunk** - All skunks share the combination of colors from white to dark gray or blackish. The hair is glossy, medium to long and easily dubbed.

**Woodchuck** - Woodchuck under fur is brown to nearly black. It is moderate in length, hard and moderately difficult to dub.

**Bear** - Bear fur ranges from white to black, including cinnamon and rusty brown. Like their guard hairs, the fur is somewhat glassy in appearance. It ranges from short to long and it is moderate to difficult to dub effectively.

**Bobcat or Lynx** - Bobcat or lynx exhibits a range of dubbing fur including white, cream, ginger, tan and chocolate patches. Medium length and fine textured, it dubs easily to moderately.

Nearly any fur can be used for dubbing material, and sometimes something picked up on your own can be very effective. Furs are best in the late fall or winter. Often they can be picked up from taxidermists, trappers, fur buyers or hunters if you do not seek them out for yourself. Simply select the animals and pelts for the colors you need.

**Spun Hair** - Numerous types of hollow hair can be used to make spun hair bodies or heads. The classic spinning hair is **white-tailed deer**. Northern whitetails have longer hair with greater flare than do southern whitetails. The southern sub-species are much better for tailing, wing material and tying collars, while the northern sub-species will produce better bass bugs and similar spun hair bodies or heads. The color of the hair varies with the location on the body from grayish tan-to-tan or brown. Small amounts of black and gray are found on the brisket of some deer, and the belly and inner legs yield white or pale tan. **Blacktails** or **mule deer** have finer textured hair that flares easily but is better for collars than is most whitetail hair. It is darker gray in general, but gray, creamy or yellowish hair can be found in various parts of the body. **Caribou** or reindeer is white to pale tan or very pale gray. The hair is fine-textured, soft and easily flared. This is the top choice for spun-hair bodied dry flies. The under fur is a bonus. **Elk** or wapiti yields hair from chocolate brown to pale tan and creamy. The hair is short to medium in length and most of it has moderate flare. It is, of course, the choice for the elk hair caddis, with elk hock hair as the hair of choice. **Moose** is similar but darker with nearly black hair on the legs. **Pronghorn** or antelope is short, stiff, slightly crinkly and reddish tan to white. Very easily flared, the hair is coarse and often brittle.

**Wound Hair** - Several types of hairs are wound around the hook in a fashion similar to the quills of feathers. **Porcupine** quills are hollow with foamy filler. They can be flattened and wound on the hook as a body or bound to the hook as an extended body. Porcupine quills float like a cork. **Moose mane** may be brown, gray, white or nearly black. Coarse and tough, it is often used as body material for tiny dry flies. **Horse mane or tail** is dense and glassy. In brown, black, tan, or white the hair can be used as body material or as ribbing.

**Quill** - Stripped outer layers of feathers, feather shafts, or peacock herl with the flue removed from it is often called quill in the fly dressers lexicon. Nearly all of these give the body a wonderfully segmented appearance.

**Cork, Balsa, Foam or Sponge** - Cork, balsa, foam or sponge can be used to make popper or bug bodies. They may be used as crayfish components or in tying spiders or other bugs for panfish as well.

**Raffia** - Raffia is a cured grass. It can be used as body material in tan or dyed colors.

**Wing, Tail or Hackle Materials Hackle Feathers** - Hackle feathers are the neck, head and rump feathers of domestic fowl or the body feathers of gamebirds. **Hen hackle** is generally soft and webby with rounded tips to the feathers. It makes excellent Matuka patterns and is preferred as hackle for wet flies and nymphs. **Cock hackles** are narrower, longer, harder and essentially free from the barbules that make the hen hackle webby. Cock hackles are preferred for dry flies. Both of these come in several grades. **Premium** hackles have short, straight barbs with minimal webbing. They are in a full range of sizes, particularly on the small end (22-28), with narrow quills that are easily wrapped on the hook. Their color is uniform and true to the standard. They are also expensive. **Dry fly** hackles are graded by their range of sizes, quill and barb quality, and color. Number 2 or **utility** grade hackles are adequate for most beginning tiers.

**Indian capes** are generally smaller than American capes, but most of them are at least modest in quality. While they may be a bit variable in color, they are an excellent bargain for many beginning tiers. **Bass or Chinese** necks are generally large capes with longer, wider hackles that may contain considerable web. They are excellent for bass flies and streamers. All of these can be purchased as loose hackles, strung hackles (on a string) or on capes or half capes.

**Saddle Hackles** - Saddle hackles are taken from the rump of domestic fowl. Roosters have long, thin quills with quality ranging from those useful for small dry flies to broader, streamer hackles. Saddles are available in saddle patches or half-patches, loose hackles, or strung hackles. **Schlappen** feathers are from the upper back or tertials. Their long hard fibers are excellent for tailing materials.

**Body Hackle** - Body hackles come from the body feathers of partridge, grouse, pheasant or similar game birds. They are used primarily for soft hackles on wet flies or nymphs. They are used for nymph wing pads as well. These like, the others are available as capes, patches or packaged loose hackle.

**Tail Materials** - Tails are commonly made of hackle fibers, hackle points, hair, yarn, peacock herl, peacock sword or waterfowl flank feathers. On larger flies like saltwater hackles or bass bugs, full hackle feathers may be used as tails. In general, soft hackles are used for wet flies and nymphs while stiff hackles are required on dry flies. Hackle points are used on some nymphs and a few dry flies, like the bivisibles. Hair tails are common on hair dry flies as well as some nymphs, wets and streamers or bucktails. Most of these patterns use bucktail, calf tail or hard hairs like woodchuck or weasel (guard hairs of the appropriate color). Waterfowl flank feathers are commonly used as tailing materials in wet flies and some nymphs, and they are used occasionally in streamers. They are soft, active materials with natural barring.

**Wing Materials** - Wings can be made of a wide variety of materials. Waterfowl flank feathers are commonly used for clumped flank feather wings. Wood duck, mallard, teal and pintail wings are the most commonly used, but others like widgeon are useful as well. Turkey body feathers are used as clumped wings on no-hackle dry flies and on some parachute patterns. Sections of waterfowl, turkey or other birds are also used for wings on dry flies and wet flies, for wing cases on nymphs, and for wings on some streamers. Guard hairs or tail hairs from deer, bear, mink, fitch, ermine, woodchuck or calf are used for many types of wings, particularly on small bucktails,, dry flies and steelhead patterns.

Marabou is used for emerging nymphs, but primarily as wings on streamer flies. It is a lively, active wing material with tremendous movement, even in still waters. Marabou also makes excellent gills for nymphs.

Peacock herl or sword feathers are used for wings, toppings for wings, and as accent feathers on many patterns. Of course, they also make excellent body materials. Yarn, floss, fur, fibers from ostrich, rhea or emu, and flash fiber or flash tinsel all can be used in wings.

**Hackle Colors** - Dyed hackle colors are generally standardized, e.g. silver doctor blue, scarlet, yellow, Highlander green, etc. They can be made from pale hackle feathers by washing in detergent to eliminate the oils in the cape, and dyeing them with either fabric dyes or specialized fly tying material dyes.

Natural colors are described by convention. They include the following:

**White** - white is exactly what it sounds like

**Cream** - cream y to yellowish, off-white

**Straw** - straw is a dark cream to pale yellowish cream, the color of wheat straw

**Pale watery dun** - a very pale grayish white

**Light ginger** - dark straw to pale golden tan

**Ginger** - golden tan

**Dark Ginger** - very pale golden brown

**Brown** - medium brown

**Coachman brown** - reddish dark brown

**Bronze blue dun** - pale blueish gray with bronze highlights

**Blue dun** - medium bluish gray

**Dark blue dun** - thunder cloud bluish gray

**Iron blue dun** - dun with brownish or rusty cast

**Badger** - white to golden with dark center stripe

**Furnace** - ginger to brown with dark center stripe and dark tips

**Grizzly** - white with black barring  
**Chinchilla** - white with thin, pale black barring  
**Red grizzly** - white with coachman brown barring  
**Ginger grizzly** - white with ginger barring  
**Cree** - white with red and black barring  
**Ginger variant** - white with ginger barring  
**Splash** - pale watery dun with rusty or dark dun blotches

### **Other Materials**

Many other materials are useful in fly tying. Many types of eyes, for example (See **Eyes on Flies**) can be used effectively on flies. Lead or brass dumbbell eyes, molded glass or plastic eyes, prismatic eyes, lacquer eyes and others can be used.

Dyes and colorants are used by many tiers to create their own colors. Fabric dyes can be used effectively if the materials are simmered with a mordant, like vinegar, until the color reaches the desired tint. Rinse the materials in hot water, followed by cold water; then dry them carefully. They can be brought to full original shape by passing them through a jet of live steam. For materials that are to be dyed after being applied on the fly, permanent markers may be used to bring out the desired color. This gives the tier the advantage of being able to tie all white flies, then color them as needed in the field.

Basically, anything that can be bound, tied, wound, wrapped or glued to a hook or other tying materials can be used in tying flies. Experiment. Have fun. Enjoy the exploration.!

### **Exhibit or Sharing Suggestions**

1. Develop an exhibit of fly tying materials and display it in an appropriate setting.
2. Develop an illustrated talk or demonstration on fly tying materials and present it appropriately.
3. Experiment with some fly tying materials you can generate locally. Record the results of your experimentation and share them with fellow fly tiers.
4. Give a talk or demonstration on fly tying materials to a group of your choosing.

### **Community Service or Giving Back Activities**

1. Prepare packets of excess tying materials to share with youth groups or community groups.
2. Assist another group in setting up a fly tying program. Consider youth programs, elder citizens, disadvantaged youth, orphans or others who may not have a mentor to assist them.
3. Include a demonstration or talk on fly tying materials in a National Hunting and Fishing Day program.

### **Extensions or Ways of Learning More**

1. Using examples of materials that are difficult or impossible to get because of legal restrictions (e.g. marine mammals, jungle cock necks), discuss the concept of endangered species or the impacts of political activities.
2. Review older fly tying manuals, particularly for salmon patterns, and attempt to follow the changes in material usage over time.
3. Research the replacement of earlier materials by synthetic materials. Compare the materials if possible and comment on the pros and cons of each one.
4. Consider the ethics of using animals or their parts in tying flies to catch fish. (See *Angling Ethics*).
5. Consider the appropriateness of using natural versus synthetic materials in fly tying. Study the sources and processes that produce the synthetics (e.g. produced from petrochemicals) and discuss the environmental impacts of the various materials.