

High Tech on the Cheap

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Key Points

Scouts have an alternative to buying expensive ready made gear.
A scout's imagination is challenged.
The scout has learned a lifeskill.
Troop program is available.

NO COTTON [show frozen jeans, frozen t-shirt, frozen cotton socks]

Cotton promotes cooling because it absorbs water. Water then evaporates off the warmer skin producing the coolness enjoyed in summer. [demonstration: ask the participants to choose a finger from each hand. Lick one of the fingers, then blow on them. Ask ,”Which finger feels cooler?”] Evaporation cools the skin, the body's temperature is lowered. Hypothermia can happen at 50 degrees F.

Summer clothes

Let Heat Escape
Keep cool
Let moisture escape
Loosely woven fabric
Cotton - absorbs moisture
and promotes evaporation
cotton is like a sponge

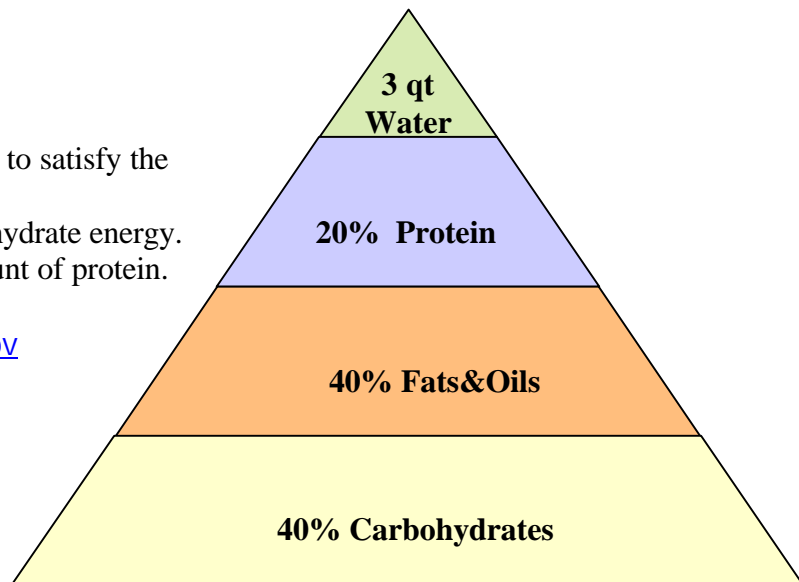
Winter clothes

Keep Heat
Stay warm & dry
Allow moisture to escape (active)
Stop moisture from escaping
need to layer & ventilate
fleece is hydrophobic, wool stays warm when wet

Heat Gain

A warm fire
Sunshine
Food = fuel

Breakfast should give enough fat to satisfy the appetite.
Lunch is abundant in high carbohydrate energy.
Dinner includes the highest amount of protein.
Crackerbarrels
Check out www.mypyramid.gov



The Winter Pyramid

Food to keep the fires stoked

Breakfast

Hot cereals - oatmeal, wheat, rice, grits

Energy bar - granola, NOT the sugar sweetened poptarts nor chocolate chips energy bars

Fruit - raisins, dried apricots, craisins, cherries, mixed berries

Fruit juice – a pure fruit juice to provide liquid, sugar for energy and vitamin C

Hot drink – cocoa, tea, hot spiced cider, eggnog

Breads – 9 to 12 grain bread and butter or peanut butter

Water

Lunch

Peanut butter, jelly, jam, honey

Cheeses

Dried meats

Sturdy crackers

Trail snack

Hot jello

Applesauce

Water

Dinner

Hot main dish - rice, noodles or potatoes; meat broth
; chicken, beef, ham and vegetables

Crackers – buttery like the Club cracker, Ritz, Townhouse

Fruit drink

Cocoa, tea, hot spiced cider, eggnog

Dessert – puddings, baked gingerbread, baked peach cobbler

Water

Crackerbarrel

The crackerbarrel should emphasize complex carbohydrates and fat. A great snack is a pre-baked potato that is put into the coals and re-warmed, then topped off with sour cream, cheese, bacon bits. A glass of water or warm drink completes the feast. The scout will stay warmer with this snack than with “some-mores” or other high sugar dessert.

Heat Loss

Conduction - the transfer of heat by direct physical contact from a warmer object to a colder one.

Example: metal seats in a stadium freezes the lower extremities if there is no insulation.

Convection – the transfer of heat by the movement of a fluid or gas. Warm air rises and creates the chimney effect.

Example: The Inuit used convection to warm the air as it entered the lower part of the coat and slowly rose to escape around the face. When winds were ferocious a sash was tied around the waist to stop loss of warm air .

Radiation – thermal energy generated within the body that escapes as infrared radiation.

Example: loss of heat through the head

Evaporation – perspiration, both sensible and insensible.

Example: sweat cooling the body.

Respiration – heat and water lost by breathing.

Example: super cold freezes the nose hairs.

Counteracting Heat Loss

Conduction - closed cell foam, newspaper

Convection – sashes, cord to stop air movement

Radiation – emergency blanket, clothing with metallic threads, cover the head

Evaporation – NO cotton, minimize sensible perspiration

Respiration – pre-warm the air through a fleece heating tube

Dead air spaces = warmth = thickness

The thicker the fabric and the more loft, the warmer the garment. Example: goose down has the best warmth rating because of the high volume of dead air space per inch.

[demonstration: Sorrel boot minus 100 deg F boot

outer layer = leather with rubber bottom

1st layer = closed cell foam insole

2nd layer = waffle weave and metal reflective surface

3rd layer = inserts 1 inch wool felt and metal reflective

4th layer = inch wool felt inside the insert

conduction

convection & radiation

cond, conv & radiation

conduction & conv



[demonstration: inside a winter tent

wind dam

sleeping bag(s)

2 sleeping pads

fleece blanket

vapor barrier

fleece booties

hat / gaiter / balaclava

clean pajamas

convection

conduction & convection & radiation

conduction & radiation

convection (dead air spaces)

respiration and lessen de-hydration & insensible pers.

conduction

conduction & convection

no day moisture brought inside

Sensible / Insensible Perspiration

Active sweat – sensible perspiration

Body's moisture requirement – insensible perspiration

Daily the body releases at least 1½ pints of water through the pores.

Winter is desert-like. There is low humidity and the body loses heat & moisture.

Dehydration happens when the low humidity of winter combined with daytime activities depletes the water inside the body. Moral: Don't sweat. Drink plenty of water - at least 2 quarts of water daily and before bed drink at least one pint of water.

If your feet are cold, wear a HAT

Why do feet get cold? The BRAIN is in charge and says, "I must live. If there isn't enough heat, I will close the shunts in the arms and legs so that I may live. The arms and legs can do without heat so that I live."

70% of the body's heat is lost through the head. Therefore, cover it and keep that heat. Wet hair conducts 240x more heat away from the body than dry hair. Therefore don't leave home with wet hair and NO hat.

MaMa says, "If your feet are cold, wear a HAT."



Be an Onion - layer

Loose-fitting layers increases dead air space

Able to regulate heat

Able to control moisture (ventilate)

Add or subtract layers to regulate heat & sweat.

Inner layers add warmth

Outer layers provide protection from wind & wet.

[demonstration: 2 vests - fleece and nylon quilted. The fleece vest is an inner garment aimed at keeping the core warm. The nylon quilted vest is an OUTER layer. If used as an inner garment the scout will be soaking wet because the nylon stopped the transfer of moisture.]

C = Clean
O = Avoid Overheating
L = Loose Layers
D = Dry

Vapor Barrier

Lessens de-hydration

Keeps in internal moisture (the body is smart enough to lessen insensible perspiration) and keeps out external moisture.

For those scouts who wear tennis shoes and have very wet feet - [demonstration: start with dry feet, add a non-cotton thin sock, a plastic bag, a thick wool or synthetic sock, another plastic bag and then the shoe or boot] The inner sock will feel damp and warm while the insulating layer [the thick sock] stays dry.

What to wear

[demonstration: get a small scout and a large scout to come up and help. Tell them they are going to peel and cook some imaginary potatoes. The small scout will cube his potato and the large scout will throw his potato “whole” into the water. Which will cook quickest? Answer: the cubed. The surface area of the cubed potato is huge. When a small scout and large scout are taken out into the cold, who will get cold quickest?]

Dressing a scout for winter

You are taking scouts into two seasons [fall/spring & winter] and two conditions [wet or dry]. Winter clothing can be divided into three temperature categories: >50 degrees F, 20 to 50 degrees F, <20 degrees F and activity levels [low to high].

| | | |
|---|--|--|
| >50 degrees F light poly short or long shirt lt fleece vest lt wt wind jacket wind pants liner socks wool or poly socks leg gaiters nylon vest as outer garment | 20 to 50 degrees F light poly short or long shirt non-cotton turtleneck windproof breathable vest lt poly long john bottoms wind pant or lt wool pant liner socks wool or poly socks leg gaiters windproof outer shell gloves, wrist warmers, overmitts 2 neck/hat gaiters | <20 degrees F use all of the 20to50 deg F wear and add: fleece jacket or wool sweater leather mitts handwarmer / wrist warmer combo heavy wool pants or quilted nylon pants windproof/breathable balaclava |
|---|--|--|

Scouter’s Emergency Clothing Kit

Bring extra gloves, mittens, socks, sleeping bag, sweatshirts, vests, boots etc for the chance that scouts will get their clothes so wet or burned by being close to the fire.

Out of a yard.....

A yard of fleece can make at least 7 useful outdoor items.

A 2009 Cost Comparison

| | <u>Campmor</u> | <u>L.L.Bean</u> | <u>REI</u> | <u>the frugal sewer</u> |
|---------------------|----------------|-----------------|------------|-------------------------|
| Balaclava | \$8.00 | \$19.00 | \$19.50 | |
| single layer bootie | \$13.00 | | \$16.50 | a |
| single layer mitten | \$9.00 | \$15.00 | \$24.00 | yard |
| neck gaiter | \$7.00 | \$15.00 | \$8.00 | of |
| headband | \$4.00 | \$15.00 | \$7.00 | fleece |
| hat | \$10.00 | \$15.00 | \$10.00 | |
| face mask | \$11.00 | \$24.00 | \$13.00 | |
| wrist bands | ----- | ----- | ----- | |
| Total = | \$62.00 | \$103.00 | \$98.00 | between \$5 & \$7 |

Resources

Volunteers of America – Salvation Army – Goodwill – Vietnam Veterans

Catalogs to send for

please note that these websites and phone numbers are accurate as of 1/20/2007

| | | |
|-----------------------------------|--|----------------|
| Campmor Catalog, Saddle River, NJ | www.Campmor.com | 1-800-226-7667 |
| REI, Seattle WA | www.REI.com | 1-800-426-4840 |
| L.L. Bean, Freeport, ME | www.Llbean.com | 1-800-341-4341 |
| Sierra Trading Post | www.SierraTradingPost.com | 1-800-713-4534 |

Fabric places to seek out:

Zinck's in Berlin, Inc **outstanding prices for Polartec windbloc [\$1.50/yard]** 1-330-893-7225
4568 state Route 39
PO Box 153
Berlin, OH 44610

Outdoor Wilderness Fabrics www.owfinc.com 1-800-693-7467
123 E. Simplot Blvd 1-208-402-0110
Caldwell, Idaho 83605 **they sell Gore-tex**

The Rainshed Catalog www.therainshed.com 1-541-753-8900
707 NW 11th
Corvallis, OR 83687

Quest Outfitters www.questoutfitters.com 1-800-359-6931
4919 Hubner Circle fax: 1-941-923-4246
Sarasota, FL 34241

Mill Direct Textiles LLC www.milldirecttextiles.com 1-978-686-7700
15 Union St.
Lawrence, MA 01842

Seattle Fabrics www.seattlefabrics.com 1-206-525-0670
JoAnne's Fabrics

Polartec LLC

BOOKS FOR THOUGHT

Fieldbook for Canadian Scouting 1-613-224-0139
Boy Scouts of Canada Scout Shop
1345 Baseline Rd., Box 5151 Station F
Ottawa, ON Canada K2C 3G7

Okpik Handbook The BSA Handbook Fieldbook BSA

Secrets of Warmth by Hal Weiss, 1992 , Cloudcap, ,Box 27344, Seattle, WA 98125

Polarfleece Pizazz More Polarfleece Pizazz

The Top 13 list to keep warm in winter

NO COTTON

Eat, eat, eat in winter = about 4000 calories

40% carbohydrates, 40% fat, 20% protein

Drink - water (2 1/2 quart minimum)

Don't sweat - keep sweat to a minimum

Feet & Seat lose heat by conduction

Wet hair loses heat 240x faster than dry hair

If your feet are cold, wear a HAT

Be an onion - layer your clothing and provide for ventilation

Air insulates - dead air spaces in clothes keeps you warm

Thickness = Warmth (the thicker the insulation, the warmer you are)

Wind protection - know the wind chill & use windproof garments

Use the Buddy system - remove snow from your buddy check for frostnip & frostbite on your buddy

Be physically fit

MATERIALS THAT MAKE COLD WEATHER "FUN"

| | | |
|---------------------------------|--------------------------|---|
| Tactel | 100% nylon | water repellent, wind resistant |
| Thinsulate | 65% olefin/35% polyester | warmest insulation around, has loft and very light |
| Lycra (spandex) | | Raschel knit = one-way stretch; Tricot knit = 2-way stretch |
| Coated packcloth | | urethane coated nylon, durable, flexible, water resistant except when puddling occurs on material |
| Coated cordura | 100% nylon | rugged, abrasion resistant, high tear strength |
| Ripstop nylon | 100% nylon | water repellent, wind resistant, flame retardant |
| Taffeta | 100% nylon | wind resistant |
| Supplex 2-ply | 100% nylon | water repellent, wind resistant |
| Polartec 100(hot) | 100% polyester | draws moisture from skin while absorbing very little into |
| Polartec 200(hotter) | 100% polyester | fiber (<1% by weight). Moisture spreads over large |
| Polartec 300(hottest) | 100% polyester | surface area to evaporate quickly. A good insulating |
| Polartec 200 with DWR | | |
| Polartec 200&300 BiPolar Series | | |
| Polartec Thermal Stretch | | |
| Polartec Windbloc Series | | |
| Robe fleece | 100% polyester | single-sided fleece, great for long-johns, wicks moisture |
| Fuzzy stuff | 100% synthetic | vapor barrier material, single-sided synthetic laminated to plastic |
| Waxed cotton | 100% cotton | water repellent |
| Goretex 2-ply or 3-ply | | waterproof & breathable |
| Windstopper by Gore | | uniquely wind resistant & breathable |
| Tyvek | | a complete vapor barrier; a one-piece suit can be bought at Cook Iron (Roch, NY) for about \$3.00 |

SIMPLE PATTERNS

Be sure the STRETCH of the Fleece is in the SAME direction as the Stretch ARROWS

Neck gaiter / Hat

Cut a fleece piece 22.5" x 10" with the stretch going the LONG way

1. Sew seam together
2. Sew a 1 inch hem on each side
3. Cut a 1/4 inch opening in one of the hems
4. insert a 25 inch lacing
5. tie lace ends together

Poncho (also a sleeping bag blanket and a poncho for "patches)

1. Measure the widest width of the person & add 5 inches
2. Measure the length from the front of the thighs, over the shoulder to the back of the thighs
3. Cut a "T" two inches off-center from the middle of the material
4. Place poncho over head and make the T-cut larger if necessary
5. Sew 3 foot laces onto poncho side
6. Tie lacing around you like a butcher's apron

Long Leg gaiter (intermediate sewer)

Materials needed: 1 yard supplex or tactel; 1 yard 1" velcro; 4 – 27" shoelaces; 8" of 1/2 " elastic

Cut 2 – 20"x25" pieces

Top – turn 1/4" raw edge over and sew. Then sew 1 " hem

Bottom - sew 1/2 " hem turning 1/4" raw edge under

Sides – sew 1/2" hem turning 1/4" raw edge under

Sew 18" Velcro onto sides

Determine the middle of the Bottom and place the mid-point of the elastic in the middle.

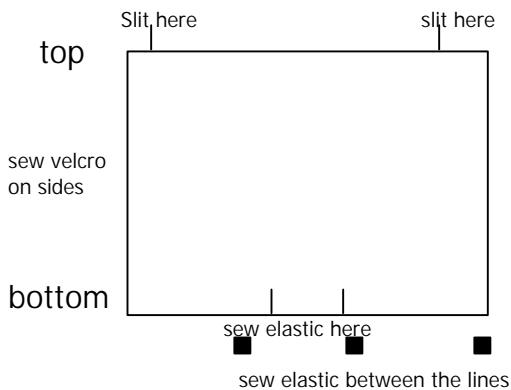
Stretch the elastic and sew onto the nylon. Cut a 2" x 10" strip of material and fold in half.

Sew. Turn right side out. Cut the strip into 2" sections. Fold the 2" section in half. Sew one on the right side of the elastic keeping the fold above the material. Repeat on the left side.

Sew another 2" Section onto the bottom right corner. Cut 2 small slits at each end of the top outside hem. Using a safety pin push a shoelace through the slit. Cut a shoelace into

12" sections. Fold a 12" lace and sew to the folded 2" section of the bottom right corner.

Use the other 12" shoelace and tie it onto the 2" sections on either side of the elastic.

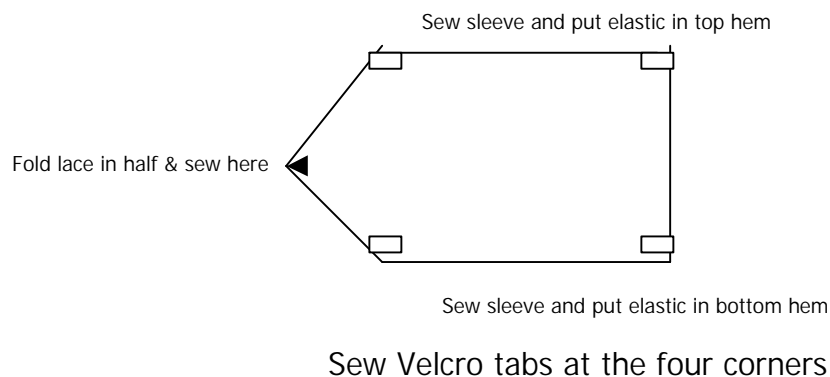


sew three loops where the dark square are. Sew shoelace into corner loop

Short Leg Gaiter (intermediate sewer)

Materials needed: 2/3 yard nylon material; 1 yard of 1/2" elastic; 4" of 1" Velcro; 2 25" shoelaces
Cut 2 – 18"x28" pieces of nylon

Turn 1/4" on the top and bottom and sew. Turn 1" hem on top and bottom. Sew.
Measure elastic to fit around the lower leg; add 2 inches to the elastic. Push the elastic through 1" hems [top and bottom]. Sew elastic at each end. Sew 1/2" hem on sides folding the material to seal the raw edges. Fold shoelace in half and sew it at the point. Sew 1" squares of Velcro in corners. Sew three loops: 1", 7 1/2" and 15" on the bottom edge. Cut the 25" shoelace in half. Sew half of the lace into the loop at 1". Tie the other part of the lace into the other two loops. Melt nylon laces.



Leg gaiter the easy way (beginner sewer)

Go to a great second hand store [like Salvation Army, Goodwill, Vietman Veterans...] and purchase an outstanding pair of lined wind pants with ankle zippers [buy when there is a half price sale]. Put the wind pants on and measure where your knee hits the fabric. Take off the pants and, adding an inch, cut the pants. Turn over the raw edge 1/4". Put in a large grommet 1 1/2" from the top. Turn over a 1" hem. Using a safety pin push nylon cording through the grommet and around the wind pant. Secure with a toggle. On the bottom of the wind pant sew three loops [1" behind the zipper; 4 inches and 8 inches in front of zipper]. Tie a 12" nylon cord onto the loop behind the zipper and 8" from the zipper [this cord goes under the boot]. Tie a 6" cord onto the loop [this will be used to tie to your bootlaces].

Wrist Warmers (beginner)

Cut two pieces of 8" x 8" fleece. Determine which way has the most stretch. Stretch goes around the wrist. Fold the fleece in half and sew a straight stitch being sure to reverse the stitch at the beginning and end of the fabric. Put your hand on the sewn fleece. Decide where you want to cut the thumb hole and cut it. Wear.

Wrist warmers with chemical handwarmer insert (beginner)

Cut two pieces of 10" x 10" fleece. Determine which way has the most stretch. Stretch goes around the wrist. Fold a 2 1/2" hem at the bottom. Fold the material in half and sew with the 2 1/2" hem on the inside. Trim seam and turn fabric right side out. Put your hand on the sewn fleece. Decide where you want to cut the thumb hole and cut it. Insert a handwarmer into the pouch. [youth: cut two pieces of 9"x9": large adult cut two pieces of 11"x11"]