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# 1) GENERAL INFORMATION

## Water Supply

The winter water supply at Marin Sierra is limited, and we're not yet sure if troops will be able to draw water from the lodge, so plan to melt the cold white stuff or bring a supply to last you the weekend.

To make a water machine, stuff a clean burlap sack with snow and suspend it over a pot near the fire. As the snow melts it drips into the pot. Near a warm fire this arrangement will supply a whole patrol if kept constantly full of snow.

## Fires and Fuel

We recommend white gas stoves for cooking. They burn hot in cold weather and don't use large volumes of fuel. Liquid propane bottles may also be used, but they put out less heat in cold weather, so cooking may take forever. Don't forget a few small squares of plywood to set the stoves on.

Fires for cooking and warmth may be built in your campsite. Bring your own wood! The stores of wood at the lodge are to be used only by the units renting the lodge throughout the winter. If you wish to forage for wood around the camp you may.

## Starting fires

Winter camping offers scouts a chance to really test their fire starting skill. When you really need the fire, don't be caught without a few tricks up your sleeve. The camp rules prohibit the use of liquid fire starters, but there are lots of other options that will get you a rip roaring fire in a short time. Some people call the use of fire starting aids cheating, but if it gets the job done, call it Yankee ingenuity. For an example of a failed fire starting attempt, see the Jack London short story "To Build a Fire". Simple paraffin wax fire starters can be made with string and newspaper, see handbook page 87. Small pieces of Duraflame logs also work well.

Experiment in a safe area at home to make sure your fire aids work. Light them first and build your fire on top. No fire starter works well without plenty of dry kindling. Keep a supply of tinder and kindling in plastic bags. Cedar shingles are great if you have them. If you have no dry wood, split open a log. Water does not usually penetrate wood more than 1/2 inch.

## **Warning! Root Fires**

**!** Remember, much of the ground around the camp is burnable, even under snow. Open fires will burn through the snow and may light the ground beneath. These fires can burn for weeks and come to the surface hundreds of feet away when the woods are dry. Plan your fire in a safe place and make sure it is out when you leave. Dig under and around the pit and feel for hot spots. Its a dirty job, but it may save the camp! Note: This is what caused the Mt. Vision fire in Marin county two years ago!

## **Rules for fires**

The following are the Camp Marin Sierra rules for fires. Remember, stoves and lanterns are also open fires.

1. Cooking fires may be built in any safe campsite area that has no limbs within 10 feet overhead and is cleared to mineral earth in a 10 foot radius.
2. At least one bucket of water and one shovel shall be present at each campsite.
3. A fire shall never be left unattended unless property banked in a shepherd stove.
4. All campfires shall be approved by the Camp Director, Camp Ranger or staff member.
5. No liquid fuel type heaters are allowed in camp. LPG and liquid fuel type stoves are permitted when used in accordance with the clearing instructions at the beginning of this section.
6. An adult (at least 18 years of age) or staff member shall be in direct supervision of a stove.
7. LPG and liquid fuel lanterns are permitted only when used on top of a sturdy table or hung in accordance with the clearing instructions at the beginning of this section. A lantern shall not be moved when lit or hot. An adult (at least 18 years of age) or a staff member shall be in direct supervision of a lantern.
8. All liquid fuel except that contained within a liquid fuel type stove or lantern or within approved backpack type fuel bottles shall be deposited with the camp director or camp ranger for proper storage. No other liquid fuel shall be stored in campsites or vehicles.
9. No open flames are allowed in tents. Use only battery operated lanterns and/or flashlights.
10. No fireworks are allowed on B.S.A. property.
11. Smoking is only allowed in designated areas which shall conform to the clearing instructions at the beginning of this section when out-of-doors. (Smoking is considered to be an open fire.)

12. Campfire permits shall be obtained by the Camp Ranger or Camp Director annually or as required.
13. Flares and torches are not normally allowed in camp and shall be used only as a part of a ceremony as approved by the Camp Director or Camp Ranger. Use of liquid fuel for starting any type of fire is prohibited.

## 2) EQUIPMENT

### Patrol and Troop Equipment

Use this list as a guide, You can add as you please.

- 2 stoves, white gas is best, with windscreens
- Liquid fuel in approved bottles (see the attached camp rules for fires and stoves)
- Fire starting kit (matches, paraffin starters, steel wool, etc.)
- Firewood, kindling and cover
- Lantern (it gets dark early in winter)
- 2-3 pots, 2-4 quart size, with lids (water boils 3 times faster when covered)
- Trash bags (bring lots, they are good for many things besides trash)
- 1 folding saw (avoid axes, the blades become brittle in cold and campsites are crowded)
- Water purification tablets, filter etc.
- Condiments - sugar, salt, pepper, etc.
- Food (normal menu)
- Group first aid kit
- Coffee pot
- 2 large spoons
- 1 pair pot tongs
- Cloth pot holders
- Shovel (several if you plan to build snow shelters)
- Tents and ground sheets (see Shelter)
- Rope, cord etc. (this is another thing you should have plenty of)
- Repair kit (wire, Pliers, tape, string, needle, thread, safety pins, file, etc.)
- Whisk brooms (for brushing off snow)
- Water container, filled (5 gallon insulated is best)
- Fire buckets (required)
- American flag and Troop flag on poles
- Emergency food
- Duty roster
- Menu
- Tarps (lots)
- Toilet paper
- Scouring pads and other cleanup stuff.

## Competition Equipment

Each patrol competing should have a sledge and the following equipment. This list is not final, it may be changed or added to at the whim of the Patrol. Refer to the event descriptions to determine what else you might need. Sledge must be at least 6 feet long and weigh 50 pounds.

Patrol flag

Troop number and patrol name on sledge (artwork will be rewarded)

Notebook and pen or pencil

Tin can or pot, 1 quart+

Scout handbook

Ice rescue materials

2 blankets

Spade shovel or trowel

6 foot poles or staves

Firewood

Rope

Rain gear for each scout

compass

Matches

First aid kit

Tinder

## **3) WINTER CLOTHING**

The clothing you pack should be your own combination of the several options available. You should be prepared for the worst weather anticipated, but not over packed. The use of the layer principle allows you to stay warm without a lot of extras. For weekend trips you need only change the lower layers to keep clean. In the coldest conditions you will need 2-4 layers on your legs and 4-6 layers on your upper body. Pay close attention to the places where clothes come together, wrists, ankles, neck and waist. Make sure they're not exposed while you're moving around. Don't forget to waterproof your boots. For more information on winter clothing see the Boy Scout Handbook pages 51-54, 164 and Fieldbook pages 331-338.

The clothing list that follows is an example only. It lists options, not absolute necessities. Use the illustration on the **“Well Dressed Sourdough”** page to plan, and lay out your clothing on the floor to make sure you have it all. Remember, avoid cotton and try to use wool. Don't bring denim jeans or jackets!

### On your head and neck

### Number to pack

Wool cap or ski mask

2

Full brim hat (felt or canvas)

Scarf

Sunglasses

Sunscreen

Lip balm

### On your body (4-6 layers)

T-shirt	2-3
Long sleeve shirt (wool)	1-2
Sweatshirts or wool sweaters (1 or 2)	2
Insulated vest	
Jacket (wool, nylon, gore-tex, leather)	
Parka with hood	
Nylon windbreaker	
On your legs (2-4 layers)	
Underwear	2
Longjohns	1-2
Sweat pants	
Trousers (wool army pants are great)	
Powder pants	
Nylon rain pants or snow chaps	

### On your feet and ankles

Wool or wool/polypropylene socks (2 pair)	6 pair
All leather hitting boots, waterproofed (nylon won't keep water out)	
Insulated rubber boots	
After ski boots (moon boots)	
Gaiters	
(Leave your tennis shoes & 1 pair socks in the car for the trip home)	

### On your hands

Insulated gloves (vinyl, gore-tex, waterproofed fabric)	1-2 pair
Wool gloves	
Mittens (oversized-can be worn over gloves for added warmth)	

### Rain gear

Poncho (this is best)	
Rain slicker	
Trash bags (for your clothes or as emergency poncho)	

### For bedding down

Wool cap	
Sweatshirt (hooded) or thermal shirt (fleece or polypropylene is best)	
Sweat pants or long johns (fleece or polypropylene is best)	
more socks	

## **THE WELL DRESSED SOURDOUGH**

Do you want to stay warm in the snow? Just remember **C.O.L.D.**

Keep **CLEAN**. Keep yourself and your clothes clean. Dirt and body oils which build up on clothing destroy its insulating properties.

Avoid **OVERHEATING**. Clothing is designed to be taken off or added in layers to maintain an even body heat. Increased activity produces more heat and perspiration. Don't let yourself get damp, see below.

Wear clothes **LOOSE** and in **LAYERS**. You can peel or add a layer or two depending on air temperature or your activity.

Keep **DRY**. Wet clothing removes body heat 240 times faster than it will dissipate through dry clothing. Wet is trouble!

### A WORD ABOUT WOOL

Your best bet for staying warm at the Klondike Derby is to wear wool. Wool is thin for its warmth value, stays warm when its wet, dries fast, breathes to allow perspiration to evaporate and the fuzz keeps snow from sticking.

### AVOID COTTON LIKE THE PLAGUE

Cotton is a popular fabric because it is light and cool. It has no place in the snow. Denim is the worst. It takes two minutes to get wet and two weeks to dry.

#### HAT

Always carry a head covering. Wool caps are best, they insulate well and cover the ears. Ski masks are great too. Baseball type caps are only good for warm weather.

#### EYE PROTECTION

Goggles are best, but sunglasses will also reduce glare from the sun off the snow, a situation which will cause painful problems, even snow blindness. Lenses should be polarized and have UV protection.

#### SCARF

Keeps cold air and snow off your neck and out of your shirt.

#### BELT PACK

This is for all those things that would normally go in your pockets, knife, sunscreen etc.. When you're wearing overpants you can't reach your pockets.

#### 6 LAYERS ON TOP

Start with a T-shirt or long johns and add layers of loose fitting wool or synthetic sweaters or sweat shirts. Top it all off with a loose, water resistant jacket (maybe borrow Dad's nylon windbreaker). Take a poncho too. It keeps falling snow away from your clothes so you stay warmer.

#### GLOVES OR MITTENS

Bring 2 pair: one for snowball fights, the other for the rest of the time. Breathable wool stays dryer than vinyl.

#### PANTS, 2 TO 4 LAYERS

Start with long johns, finish with water resistant chaps or nylon rain pants. In between you can wear layers of sweat pants, scout pants or wool. Powder pants or wool army pants are great for an outer layer. Suspenders are useful because they don't cinch like a belt to make breathing tough.

#### GAITERS

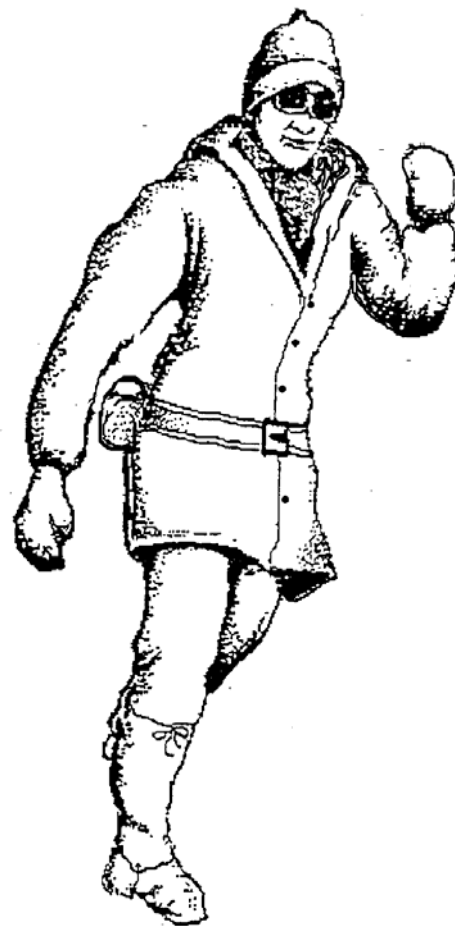
These are sleeves of water resistant fabric that lace up in back and tie at the top, below your knee. They keep snow out of your boots.

#### SOCKS

Wear two pair if they'll fit in your boots. Use wool or fluffy synthetics. Polypropylene blends and boot liners will keep your feet dryer. Change your socks often to stay warm and prevent blisters.

#### BOOTS

Proper footgear is essential, you're standing on an ice. Keep your feet dry. A boot should fit somewhat loose for warmth, but the adage "cool is comfortable" is true-, the feet should not sweat profusely. Avoid rubber boots without insulation, they'll turn your toes to ice cubes. Moon boots are great, but if they're too loose you may lose them in deep snow. Leather hiking boots work well when treated with Sno Seal, silicone, or shoe grease. Fabric sided hiking boots can be treated with silicone sprays but can't be completely waterproofed.



## 4) SLEEPING SYSTEMS

These are items that you will need *IN ADDITION* to your sleeping bag.

### Ground cloth

purpose: to keep ground moisture out and to help protect your tent and sleeping bag and keep them clean

qualifications: large enough to cover your sleeping area, but not too large. Thick enough to prevent punctures and rips.

### Bottom Insulation

purpose: your body compresses the sleeping bag and loses all of the loft below you. It also prevents conduction

good materials to use alone:

- any closed-cell foam pad - (doesn't soak up water, doesn't let air pass through it, prevents convection)
- Therm-A-Rest - (water-proof, prevents heat loss through conduction, convection and radiation below you)

bad materials to use alone (but may be used in combination of two or more)

- cots - (lets air circulate beneath you)
- open cell foam pads - (soaks up water just like a sponge and lets air circulate)
- newspaper - (soaks up water)

bad materials to use anytime:

- air mattresses - (your body doesn't have enough energy to heat up the air in it)

## 5) DEHYDRATION

### You Need Water in Winter--Avoid Dehydration

Your body requires water in winter just as it does in summer. Under normal winter conditions the average adult loses 2 to 3 quarts of water per day through sweating, respiration, and elimination. Cold, dry winter air can cause you to

dehydrate quickly, especially with windy and/or sunny conditions. Dehydration upsets your body's metabolism making you less hungry and increasing your susceptibility to hypothermia.

Unfortunately, cold temperatures tend to suppress thirst. You can become dehydrated without being thirsty which is not usually true in summer. To get adequate quantities of water in winter you may need to force yourself to drink liquids.

The need to remove clothing to eliminate body wastes and the lack of readily available water, as well as suppressed thirst, are factors that tend to inhibit your intake of water. Many people have a pronounced tendency to put off consuming water unless they are thirsty. In normal living situations we depend on our thirst system to maintain an adequate intake of water, but this cannot be relied upon in cold weather.

An alternative water machine can be contrived using a large sheet of black plastic on a sunny day. Position it on a slope, sprinkle powder snow on top and direct the flow of water to your pot or No.10 can. On a cloudy or severely cold day this method will not work so avoid relying on it exclusively.

## 6) COLD-WEATHER PROBLEMS. FIRST AID

Condition, Cause, Symptoms, and Treatment

**Condition:** Hypothermia

**Cause:** Cooling of the inner body core to below normal temperature, inadequate clothing, inadequate shelter prolonged exposure to high winds, dampness, or cool temperatures, insufficient generation of body heat overexerting oneself. Slim athletic persons are more susceptible because their bodies lack resources of fat to produce energy.

**Symptoms:** Uncontrollable shivering, difficulty in speaking, loss of muscle coordination, exhaustion, ability to reason impaired, slowing of pulse and respiration, cannot stand or walk, eventually unconsciousness and death.

**Treatment:** Prevent further heat loss. Replace wet clothing with dry. Shelter from wind and weather. Give hot, sugary drinks, or warm food, if subject is conscious. Warm subject from inside out if possible. Keep subject awake until his body has been warmed. For severe hypothermia apply warm objects to subject's ribs, head and neck and groin areas. Handle with extreme care--do not rub or massage extremities. Get subject to a doctor as soon as possible.

**Condition:** Windburn

**Cause:** Excessive exposure of skin to wind.

**Symptoms:** Burning irritation and reddening of affected skin.

**Treatment:** Apply ointment designed to treat windburn or sunburn. Prevent further exposure of flesh to wind.

**Condition:** Frostbite

**Cause:** Freezing of portion of the body. Usually an exposed part of the face or extremity. Most often occurs in cold, windy conditions. Can also occur from grabbing metal items with bare hands, spilling of gasoline or fuel on the body, or restriction of blood circulation.

**Symptoms:** Grayish or yellow-white spots on the skin. numbness in affected part, sometimes painful. Frost-nip, the first sign of frostbite, will cause a tingling sensation as part is warmed.

**Treatment:** Do not rub the affected part. Do not forcibly remove clothing adhering to affected part, thaw it loose. Warm frozen part on bare flesh under armpits or stomach of person not having problems or re-warm in 108-110 degree F. water. Walk out on frozen feet. Do not allow part to refreeze.

**Condition:** Snowblindness

**Cause:** Excessive exposure of unprotected eye to extreme light, usually on snow, sand, or water.

**Symptoms:** Burning and reddening of eyes, eyes may water and swell shut, throbbing pain around eyeballs, forehead, flashes of light cause pain. Halo seen when looking at lights.

**Treatment:** Apply cold compresses over eyelids. Give aspirin to subject. Place light-proof bandage over eyes, or put subject in dark room with minimal light. Do not use eyedroppers or ointment. Use caution to prevent reoccurrence.

**Condition:** Trench Foot

**Cause:** Prolonged exposure (usually 48 hours or longer) of feet or flesh to moisture at temperatures just above freezing, causing death to affected tissue.

**Symptoms:** Feet and toes or other affected flesh, are pale and feel cold, numb, and stiff.

**Treatment:** Remove constrictive clothing and warm affected part at 70 to 80 degrees F. If water is used, it should feel slightly cool to forearm. Protect injured part with dry dressings. Litter patient if necessary.

**Condition:** Dehydration

**Cause:** Loss of body fluids from sweating and/or insufficient intake of water.

**Symptoms:** Body temperature rises, subject feels less need to drink. Greater water loss from sweating, dark urine.

**Treatment:** Regular intake of water at frequent intervals. Pace work. Replace body salt loss also by eating salty foods.

**Condition:** Carbon Monoxide Poisoning

**Cause:** Fire burning in an unventilated shelter or incomplete combustion in a ventilated, shelter. Carbon monoxide is freely generated by a yellow flame stove, flame should be blue. Avoid using flames inside shelters.

**Symptoms:** There may, be none. Unconsciousness and death may occur without warning. Some times there may be pressure at temples. burning of eyes, headache, pounding pulse, drowsiness, or nausea.

**Treatment:** Get subject into fresh air at once. Keep warm and at rest. If necessary, apply artificial respiration. Give oxygen if available.

**Condition:** Sunburn

**Cause:** Excessive exposure of skin to sun's ultraviolet radiation.

**Symptoms:** Reddish skin, burns, blisters, swelling, or puffiness of extremities, insufficient sweating.

**Treatment:** Cool the skin, cover exposed areas, treat for burns and shock. Prevent further exposure to sun.

## **7) SNOWSHOES & SNOWSHOEING**

While the exact origin of snowshoes is unknown, foot extension devices originated in Central Asia as early as 4000 BC. Much later, the North American Indians became great innovators in designing snowshoes. In the 1600's, the French who moved into the St. Lawrence river area intermingled with the Algonquin Indians and quickly learned how to use snowshoes in winter.

Today, this winter sport still has plenty of practical application as well as being fun. Even if you prefer cross-country skiing, you need to know how to snowshoe when the snow is too powdery, where a slope is too steep to negotiate on skis, or in heavy timber where skis are not sufficiently maneuverable. It may also be more practical to don snowshoes to go outside for an arm load of wood to burn in your fireplace or wood burning stove. There are times when a bit of snowshoeing can save a lot of back breaking snow shoveling.

The purpose of snowshoes is to permit the wearer to travel atop snow instead of plunging through powder or crust with virtually every step and quickly becoming overheated and/or exhausted. Stepping out of a hole requires great effort since it requires lifting the foot and leg upward against gravity and forward against the snow.

Snowshoes spread your weight over a greater surface of the snow providing various degrees of flotation - the ability to stay on or near the surface of the snow. The amount of flotation provided depends upon three factors: (1) the snow conditions (powdery, crusted, slushy, etc.), (2) the weight of the snowshoes including pack and (3) the amount of surface over which that weight is distributed. The area covered by the bottoms of the snowshoes determines the distribution of weight. You have no control over snow conditions, limited control over your weight including pack, but considerable control of the amount of area over which your weight is distributed.

A large pair of boots cover about 50 square inches of surface on the bottom. If you weigh, let us say, 150 lb. including your pack, you will exert a pressure of 3 lb. per square inch. This concentrated pressure on a relatively small area usually will cause your boot to plunge into the depths of the snow. Snowshoes on the other hand, vary from about 300 to as much as 600 square inches of surface area. Thus, with small snowshoes such as bearpaws, you will exert a pressure of only 1/2 lb. per square inch and with large snowshoes, such as the trail type, you will exert as little as 1/4 lb. per square inch of surface. Most snow conditions will support you rather well in large snowshoes because your weight will be widely distributed over the surface of your snowshoes. In fresh, powdery snow, you may

sink in several inches even with large snowshoes, but it will be far easier to walk with snowshoes than without them. In other words, you will have a lot more flotation with snowshoes.

## **8) SHELTERS**

During winter, shelter is very important. At night temperatures can drop far below freezing. If you have the right kind of shelter you won't even notice the change. You must be prepared for rain, snow and wind. Think of what happens when a foot of snow falls on top of your tent or snow cave. Does it collapse? If its wet out, will you be dry? Can you move around enough to change clothes? Also pay close attention the pad you sleep on. Its the only thing between you and the snow. Plan carefully!

When choosing a tent to use you should think of space, warmth, and stability. Try to get a tent that is rated for more people than will be in it. When the label says "four man tent" it usually means four stunted nine-year-olds. You need room for packs and for changing. Big dome tents are good for this, so are tents with a "boot" at the rear for storage.

When the air is cold outside the tent, it makes water vapor on the inside condense on the walls. In the morning you'll be swimming in your own breath if your tent is sealed tight. To avoid this, use a tent with a net top and a rain fly, or leave the door open a bit. Be sure the tent is waterproofed top and bottom, and always use a ground cloth. If you have one, spread a blanket on the floor to keep off the chill of cold nylon.

Some tents are not made to be snowed on. A-frame tents often sag towards the center when loaded, but they can be used if you are careful to occasionally take the snow off. Dome tents and arch tents may fare a bit better, but you should never leave more than a few inches on the roof. Snow on the tent can be helpful, it traps air and acts as an insulator, so you stay warmer.

After you pick your tent site, prepare the snow to sleep on. Pack it down flat with skis, snowshoes, or boots. As soon as your tent is up, crawl inside and smooth the floor. By nighttime the snow will be hard as a rock, so do a good job.

Tent stakes won't hold in snow, and even dome tents should be anchored for wind. To make a "deadman" anchor, tie a short cord around a few foot-long sticks. Dig a hole about a foot

deep where you want the anchor. Fan out the sticks at the bottom and bury them. Then just tie your tent rope to the cord. Always use a separate anchor cord. The knots may freeze, and you may have to cut the cord.

## **NATURAL SHELTERS**

Here are some descriptions of shelters that can be built from natural materials. Diagrams of some of these structures are also included.

***SHELTER TYPE:*** Snow Dome

***TIME:*** 15-20 man hours

***HOW TO CONSTRUCT:*** Pile up mound of snow 6-8 feet high and 12 feet in diameter. Insert sticks 12-15 inches into mound at scattered locations. Let mound freeze (This will require about 2 hours) so that the snow sets up. Tunnel in and dig to protruding points of sticks. Poke several ventilation holes through the dome and close the entrance to prevent cold air from pouring in.

***ADVANTAGES:*** This provides more permanent long-term shelter. Shelter will be tall enough to stand inside. A single candle will provide plenty of heat, if the entrance is kept closed.

***PRECAUTIONS:*** Stay as dry as possible. Avoid overheating while building shelter. Keep digging tool inside in case shelter becomes drifted over. Make several ventilation holes in case one closes. Do not build fire or use stove inside. The danger of carbon monoxide poisoning is too great.

***SHELTER TYPE:*** Snow Cave

***TIME:*** 3-4 man hours

***HOW TO CONSTRUCT:*** Find drift 6-8 feet high on the side of hill or ridge. Tunnel into drift with a T-shaped entrance. Use your arms to push snow out of arms of "T". Once inside is large enough, close top arms of "T" with snow blocks. Pack down one arm of "T" and sleep on this higher bench. Walk in and out of shelter along trunk of "T".

***ADVANTAGES:*** End result is large enough for 3 persons, one across back of "T", and one on each side. Horizontal bar of "T" permits quick removal of snow from this interior. Provides long-term type of shelter.

***PRECAUTIONS:*** Avoid overheating while building shelter. Stay as dry as possible. Make several ventilation holes in case one closes. Keep digging tools inside in case shelter gets drifted over. Do not build fire inside the danger of carbon monoxide poisoning is too great.

**SHELTER TYPE:** Igloo

**TIME:** 15-25 man hours

**HOW TO CONSTRUCT:** Cut large blocks (24"x40"x6") from snow fashioning partial set as you do. Spiral blocks around outside, increasingly inward as you go. Slope sides of blocks at an angle to hold them in place. Put key block in place at top. Fill any cracks or crevices with snow.

**ADVANTAGES:** Provides excellent long-term shelter. Igloos are more roomy than any other type.

**PRECAUTIONS:** Do not attempt as survival shelter unless you've built one before. It requires considerable time and expertise. A snow knife is essential to cut blocks and angle the ends. Round roof interior to prevent dripping.

**SHELTER TYPE:** Snow Pit

**TIME:** 1/2 man hour

**HOW TO CONSTRUCT:** Deep snow is required. Simply dig out a pit large enough to sit and/or lie in. If you have a tarp or other large piece of material, place it over the top. Weight down the edges with branches and cover with snow. Tunnel into one end of the shelter for access. Entry way can be filled, keep out cold once you are inside.

**ADVANTAGES:** Shelter is easy to build and gets you out of the wind quickly.

**PRECAUTIONS:** Select area out of wind for shelter so the tarp will not be apt to blow away. Put some type of insulation under you to keep warm and dry. Be sure you have several ventilation holes. Check them frequently to avoid clogging.

**SHELTER TYPE:** Snow Trench

**TIME:** 2 -4 Man hours

**HOW TO CONSTRUCT:** Snow must be firm enough to cut blocks. Cut blocks to form trench just large enough to lie in. Lean ends of blocks together over trench forming a pup tent like top.

**ADVANTAGES:** Shelter provides excellent wind break and provides good insulation against cold.

**PRECAUTIONS:** Handle blocks with care so they do not crumble. Put insulation around you to keep warm and dry.