BLUE RIDGE MOUNTAIN RESCUE GROUP
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INSTRUCTOR'S LESSON PLANS

Cover Sheet

COURSE: BASIC MEMBER TRAINING COURSE

LESSON: #1: INTRODUCTION AND SURVIVAL

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DATE: 15 August 1979

All reviewers please sign (N.B. please initial all comments in text)

Date	Name	Comments
Feb 80	K Conover	Incorporate info. on Handwritten P. 14
(Continue on reverse if necessary)		

☐ APPROVED _____ _____
Date Training Officer

☐ REVISED AND APPROVED (original with comments in Group files)

_____ _____
Date Training Officer

T (SED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
Ø. (--) (15) (25) I. Introduction	REGISTRATION, INTRODUCTION OF INSTRUCTORS.	
5min.	A. How the BRMRG Fits In 1. The ASRC a. brief history b. present organization	
5min.	2. Local SAR a. the Responsible Agent concept b. County Sheriff/ USNPS Superintendent rule of thumb c. The real situation in VA d. other organizations: VAVRS, VA CAP, CAP GSAR, VSARDA e. state and local EMS and OEES	Note that the ASRC cannot be a Responsible Agent Note that USFS is not a R. A. Note BRMRG participation in local EMS Council, competition between EMS and OEES on state level
2min.	B. Past missions and present capability 1. Lost person SAR capability a. FTLs b. Mission Staff 2. Downed aircraft SAR 3. Technical rescue 4. Describe recent missions 5. Briefly describe Group equipment and locker	
5min.	C. Ye Compleat BRMRG Basic Member 1. Personal skills: survival, wilderness travel, land navigation 2. Group skills: EMT, search tactics and organization, mtn. rescue 3. Physical and mental conditioning 4. Experience and leadership 5. Commitment and readiness to go 6. Personal equipment, <u>organized for QR</u> 7. In short, a superman (or -woman) who can handle any basic mtn. SAR task.	

T (SED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
5min.	D. Organization 1. The SAROP: Authority of MC, OO, FTL, QRL, and importance of the chain of command; how to deal with enquiries 2. Administrative organization: Group officers (Introduce if possible) 3. Alerting and callout: explain and distribute rosters and SAFs 4. Image: point out the importance of a. good appearance of Group members b. good behavior of members	Stress the importance of <u>not</u> acting independently of established procedures, due to political reasons, if not practical ones. Note that PR efforts must always go through the Information Committee. Note the prejudice against a "bunch of college kids", and the reason for a neatness and restraint not quite normal to outdoorspeople.
5min.	E. Closing clichés and wisdom 1. Being a Trainee is a real hassle 2. "A dead rescuer never did anyone any good" and neither did an incompetent one.....know your limitations 3. "You gotta be <u>hard</u>!" 4. DON'T GET SEPARATED FROM YOUR PACK!	Note that the Group uniform may be worn by all voting members, including Trainees; and remember that it is worse to look or act bad in a uniform than not to wear the uniform at all. But don't overextend yourself; it is considerably worse to be stupid than just a wimp.
II. Survival Priorities and Psychology (0:15) 0:05 5min.	A. Survival priorities: Air/Shelter/Water/ /Food	Chalkboard: 3 min/3 hr/3 days/3 weeks
	B. How long can someone be lost in VA?	Discuss. Point out small extent of wild areas. Point out importance of short-term survival = shelter.
	C. Psychology: 1. Fear is normal, but must be kept under control; most fears are from imagination 2. Discomfort must not push you away from the proper actions in a survival situation. 3. Panic is the attempt to relieve anxiety by action, even when the action is inappropriate. Channel your energy by fixing on a constructive response. Use the STOP mnemonic.	Chalkboard: S top T hink O bserve P lan

T (SED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	D. In civilized places, we depend on others for our survival; if someone gets hurt, it's often someone elses fault. In the mountains it's your own responsibility. "Don't fool with Mother Nature. She doesn't accept excuses." Don't even trust a trip leader; don't be a sheep (sheep can be led to their deaths)	Discuss briefly an example, such as a person falling over a toy left on a sidewalk and spraining his ankle. Compare with a person spraining an ankle on a rock in the trail.
	E. The outdoors is a hostile environment, just as is outer space or underwater. Your pack is your life support system. DON'T GET SEPARATED FROM YOUR PACK!	LOUD (again)
III. Homeostasis (0 0.	A. The body is a mechanical, electrical, chemical machine; and you need to know how to keep it running properly, how to know when it has problems, and how to repair it.	
	B. Chemical reaction rates (including those of the human body) depend on temperature, and there is only a narrow range of temp. in which the body can work properly. Mechanisms exist to keep the body temp., and other body conditions, within the same range of tolerance. These are known as homeostatic (homeo=same, static=stay) mechanisms.	Note that there is an area in the hypothalamus of the brain that monitors the core temp. and regulates heat homeostatic mechanisms.
20	C. Your body is constantly producing and losing heat. If the balance is upset by losing heat too quickly, or not quickly enough, a dangerous change in core temp. may result.	
	D. Let's look at the body's heat exchange with the environment, from two viewpoints:	

T (SED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	1. A Physicist would see the following mechanisms: conduction, convection, evaporation, and radiation.(explain) 2. A hiker with a more empirical view might regroup these into terms of the enviroment: a. Temperature chill b. Wind chill effect (on exposed flesh) c. Wet chill 3. Wet chill deserves some careful attention, as it is the most dangerous. Why? The thermal conductivity of water is how many times that of dry air? (240X) The conductivity of most dry clothing is close to that of dry air, but that of many types of clothing is close to that of water when wet.	←
	E. Physiology	
10	1. The body is always producing heat through <u>Basal Metabolism</u>. When you exert the body, it produces more heat; this can be by voluntary work, or by involuntary shivering, which can produce heat at a rate 5 times the basal rate for short periods.	Similar to a car engine idling: heat, but no motion. Similar to a car going down the road. Similar to a car with an automatic choke that speeds up the idle until the engine is warm.
	2. The body runs on food and oxygen which is transported to the cells by the blood, "burnt" there, and the waste transported away by the blood. Blood also carries warmth directly.	Note that this burning is what produces heat.
	3. What is it that is your main way of adjusting to changes in heat production and outside temperature? (the skin)	

T(IMED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	4. When the body core temperature starts increasing, blood vessels in the skin get bigger, and sweating occurs; this causes more heat losses from evaporation and radiation, which lowers the core temperature. But, stores of salt (lost in sweat) and water are limited.	
	5. When the core temp. starts dropping, the blood vessels get smaller, and the skin temp. drops, to conserve heat. (but usually there are occasional flushes of blood to prevent freezing, even when the skin is very cold.)	
	6. If this decrease in skin temp is not enough, shivering may occur, increasing the metabolic rate and heat production.	Point out the cost of shivering in terms of valuable energy.
	7. Shivering or other strenous work may use up available energy, so that <u>exhaustion</u> may occur. The <u>energy level</u> one has is dependent on what you eat, among other things.	Demonstration: have everyone hold out an arm straight from the shoulder, palm up.
	8. It is also possible to suffer from <u>fatigue</u>, which is a build-up of waste products. It is possible to be exhausted but not fatigued, or vice versa.	Point out that the arms are becoming fatigued, even though plenty of energy is available. The muscle can't get enough O_2 to burn the food completely, so wastes such as lactic acid pile up. As the arms are put down, the lactic acid is burnt to CO_2 and H_2O. This oxygen debt is also obvious to runners.
	9. Even when the core is cold, the head and neck stay warm. Why? Because the brain is the most vital organ. So, "if your feet are cold, put on a hat".	

TIME (PLANNED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	10. Drugs affect your metabolism and homeostatic mechanisms. Alcohol--causes excessive enlargement of blood vessels in the skin Tobacco---causes excessive shrinking of blood vessels in the skin Aspirin---causes the core temperature to droup a degree or so 11. Your knowledge of this physiology may save your life.	
IV: (20) ~~III~~. Cold-Weather Problems (10)	PACK BREAKDOWN + BREAK A. Hypothermia 1. Hypothermia is defined as a below-normal core temperature. It is the #1 killer of people in the outdoors.	(hypo=low, thermia=temperature)
	2. There are three types of hypothermia that we can define: a. <u>Acute Hypothermia</u> results from a very sudden cooling, as when falling into a stream in winter. b. <u>Subacute Hypothermia</u> results from exposure to severe "hypothermia weather" (wind & rain at about 32°F) or similar circumstances. c. <u>Chronic Hypothermia</u> is the result of long exposure to cool or cold temperatures, usually found in the elderly or ill. Often people with chronic hypothermia have a puffy appearance and an acetone breath.	Note that these are somewhat artificial distinctions, and that they are not widely known or accepted. However, they provide a useful way of talking about hypothermia.
	3. Subacute hypothermia occurs in several fairly distinct stages (see Table I)	
	4. The first step in treating <u>any</u> hypothermia: stop further heat loss.	

(PLANNED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	5. The treatment for acute hypothermia or stage I or II subacute hypothermia is to rewarm rapidly (although with certain cautions)	
	6. Rewarming methods:	
	a. Warm drinks are recommended by some authorities on hypothermia; they put warmth right into the core. But beware the danger of aspiration into the lungs with a semi-conscious patient.	
	b. Put the victim into a sleeping bag with another warm person, but never put a hypothermia victim into a sleeping bag alone; a U.S. Coast Guard study showed that most healthy subjects could <u>not</u> rewarm themselves from stage II hypothermia, without heat from outside.	Point out that unethical but informative experiments carried out by the Nazis during WW II showed conclusively that it worked better with a person of the opposite sex.
	c. Use heat packs. If this is done, they should be placed in areas of high heat exchange: the groin, the lateral high chest (armpits), the neck.	
	d. Special warm air or warm O_2 devices exist, and are effective; also, some "hydraulic sarongs" consisting of a blanket of tubing through which warm water is forced, are effective.	Point out that these are used by some mountain rescue teams, but are not in general use.
	e. The victim may be put into a warm ($105^{o}F$) tub of water, but such very rapid rewarming may cause problems:	

TIMES (PLANNED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	-- Rewarming shock, caused by the expansion of blood vessels due to the effect of heat on the skin. -- Afterdrop, which means that the core temp will drop, due to a sudden influx of cold blood from the arms and legs. -- Arrythmias (irregular heart activity which may lead to a heart attack). They result from the "bad blood" coming into the heart suddenly. f. The solution for those problems is to leave the arms and legs out of the tub, to put a warm wet towel around the neck, and to monitor vital signs closely for signs of shock. If they appear, the rewarming must be slowed.	If there are questions as to how this causes shock, point out that an expansion of the vascular system occurs, and there is not enough blood to fill it then. Point out if appropriate that the arms and legs may have a lot of waste products built up from an inadequate blood supply. If the systolic blood pressure drops suddenly, the pulse rate increases suddenly, or the state of consciousness decreases the rate of warming must be slowed.
	7. For chronic or stage III and IV subacute hypothermia: a. Avoid further heat loss, but do not rewarm, or allow to become warmer; b. Do not bounce or jar the victim, as this may cause a heart attack; c. Transport to a hospital immediately. SEE INSERT P. 9.5	Note that rewarming in these cases is quite difficult, and should only be done in an Intensive Care Unit or similar facility. Note also that Advanced Life Support techniques (defibrillation and drugs) do not work on hypothermic victims. Also, intubation or overventilation may cause cardiac arrest.
(5)	B. Frostbite 1. When blood flow to limbs is cut down to prevent heat loss, there are still "flushes" of blood to each part intermittently, usually enough to prevent freezing. Thus under normal conditions frostbite is impossible. 2. However, the following may cause frostbite:	Point out that it is possible to walk barefoot in the snow without frostbite, but that tight boots almost guarantee it.

TIME (USED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	7. Treatment of chronic and deep (Stage III or IV) hypothermia is aimed at maintaining an adequate supply of oxygenated blood to the brain until the victim may be rewarmed properly at a medical facility. However, at low temperatures, the metabolic needs of the brain are very small. Therefore the slight circulation provided by a hypothermic heart may be enough, if the heart does not arrest (stop). Any action that might cause cardiac arrest must be avoided if there is any heartbeat. If there is no heartbeat at all, Basic Life Support CPR must be administered until the victim is rewarmed. Therefore, such victims should be carried out <u>gently</u>, while being insulated from further heat loss. Rewarming in the field is probably doomed to failure. Therefore, no attempt should be made to do so, and accidental rewarming (e.g. in a warm ambulance) must be avoided.	Note that drugs and defibrillation do not work on hypothermic patients. Note that although external cardiac compression is not appropriate, artificial respiration may be used to good advantage, provided overventilation and intubation are avoided.

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	a. Hypothermia, exhaustion, fatigue, injury, or illness may interfere with the mechanisms that normally prevent frostbite.	
	b. Contact with very cold metal, or contact with very cold liquids such as gasoline or alcohol may cool the flesh far more quickly than the body can react, resulting in instant frostbite.	Point out the dangers with using and refilling stoves in deep winter.
	c. Tight clothing or boots may restrict circulation and cause frostbite.	Point out the stupidity of wearing two pair of socks with a pair of boots fitted for one pair "to keep your feet warm".
	3. Types	
	a. Frostnip or superficial frostbite is when the fluid between the cells in the upper layers of skin freezes, forming ice crystals. Frostnip may be recognized by a sudden paling of the affected area.	Point out that cells die not by freezing but by dehydration caused by the intercellular fluid ice crystals "sucking" water out of the cells. Note the usefulness of checking each others' nose, ears, etc.
	b. Deep frostbite is when underlying tissue becomes frozen; the part is still pale, but becomes hard to the touch.	
	c. Trench foot or immersion foot looks like frostbite, but is caused by prolonged exposure to cold wet conditions. It is a result of direct problems with circulation, rather than freezing.	
	4. Treatment	
	a. Frostnip is best treated by immediate rewarming in a warm armpit or by a warm hand.	"The height of brotherly love is rewarming a companion's frozen feet on your stomach."
	b. Deep frostbite should be rewarmed in	

(ELAPSED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	warm (105°F approximately) water. If no thermometer is available, the water should be very hot but bearable to an elbow held in it for a minute or so. c. After rewarming, the limb will become red, painful, and sometimes blistered. It is vitally important to avoid pressure or damage to the area. d. In several days to a few weeks, the affected area will turn black and fall off. The body will make an accurate judgement as to which area should fall off, so no amputation is ever necessary. The main problem to avoid is infection, so keep it clean.	Point out that frostbitten limbs have no enervation and thus could unwittingly be parboiled. Note that it is possible to walk out on frozen feet without further damage, but that a person with thawed feet must be carried out. Note that even the weight of a sheet over the feet is too much. Cotton is usually placed between the toes or fingers.
V. ~~IV.~~ Hot Weather Problems (:) (15) :	A. ~~Review the normal response to heat; note that salt and water are used up.~~ B. Excessive salt loss may lead to heat cramps. 1. Heat cramps usually start in the legs or abdomen, come on gradually, and are not relieved by massage. 2. Treatment is to rest and replace the missing salt. 3. The best way to avoid heat cramps is to eat enough salt. C. Water loss leads to dehydration. 1. Signs and symptoms are thirst, dizzyness, nausea, tunnel vision, lightheadedness, and dark urine. Thirst is	At environmental temperatures near or above the normal core temperature, radiation, conduction, and convection can only serve to cause heat input. Therefore, the only method to allow the necessary loss of metabolic heat is sweating and evaporation. A major form of heat adaptation is a decrease in the salt content of sweat to conserve sodium. It is important to cover your head, and to wear loose clothing that covers most of the body, to avoid excessive heat input, when in a hot environment. Point out that the best treatment for cramps in general is to stretch them. Note that salt tablets must be taken with plenty of water, otherwise severe nausea. Point out that the best way to take in salt is to salt meals heavily, AS THE FOOD LESSENS THE IMPACT OF THE SALT ON THE STOMACH, AND THE SALT IS ABSORBED MORE READILY WITH FOOD.

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	not an adequate indicator of WATER NEEDS AND dehydration, but dark urine is a good sign.	
	2. Dehydration is a large problem in winter AS WELL AS SUMMER because:	
	a. About 1 liter of water per day is lost in <u>insensible perspiration</u>, even when the skin is cool.	Note that this will cause condensation even without sweat.
	b. It is hard to find liquid water in winter, and there is a tendency not to stop and drink due to the cold.	Note that it is a good idea to stop regularly and drink some fluid, even if not thirsty.
	c. Evaporation from the lungs is great due to the dry winter air, plus the fact that all air entering the lungs is warmed and humidified.	Note that a <u>rebreathe flap</u> or scarf over the mouth and nose will soon become moist and cut down on these losses, as well as warming and humidifying the incoming air.
	~~3. In a hot environment, wear loose light clothing, and wear a hat to prevent overheating from the sun.~~	
	34. In a dehydration survival situation, <u>ration your sweat, not your water</u>. The water keeps just as well inside you as in a canteen, and makes you feel better.	Point out that people have been found dead of dehydration in the desert with water still in their canteens. Unless excessive water is taken in, the kidneys will do an excellent job of conserving the water, and no extra urine will be secreted.
	D. Excessive exercise in a hot environment may lead to loss of salt and water, and to a condition known as <u>heat exhaustion</u>.	
	1. A person with heat exhaustion will collapse, will ~~be~~ have pale, cool and clammy skin, and a rapid pulse; often the person is nauseous or vomits, AND MAY BE SOMEWHAT CONFUSED	Note that there is no well-recognized distinction between heat exhaustion and dehydration. Heat exhaustion is thought by some to be a result of excessive loss of salt and fluid, when replaced by fluid with inadequate salt content. This results in a fluid shift to the intercellular fluid, and a hypovolemic shock-like state.
	2. Heat exhaustion is not a true emergency, but is the body's way to say "slow down". It is a form of shock like fainting.	
	3. The treatment is to elevate the legs,	

(ELAPSED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	rest in a cool area, and replace some salt and water.	
	E. Excessive exposure to heat and humidity or excessive exercise in a hot environment may result in <u>heatstroke</u> (sunstroke).	
	1. A person who suffers heatstroke usually has had decreased sweating for some time, then suddenly stops sweating, and collapses. The skin is hot, dry, and red or sometimes mottled. The core temperature is high.	
	2. Heatstroke is a true medical emergency, as the temperature-regulating mechanisms no longer work, and the body core temperature may rise high enough to permanently damage the brain.	Note: the mortality rate for heatstroke is approximately 50%.
	3. The treatment for heatstroke is to bring the body temperature to within normal limits, and keep it there. The victim should be taken to a medical facility immediately, with normal first aid protection for the airway, etc.	Note: heatstroke victims are often unconscious, and may have a depressed gag reflex. Positioning on the side is highly recommended to prevent aspiration. Note that the same high heat exchange areas used for rewarming hypothermia victims may be used to cool heatstrake victims.

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VI CLOTHING, SHELTER, AND PERSONAL EQUIPMENT	A. Outdoor Clothing 1. Outdoor clothing must be rugged, and protect from the 4 environmental stress stresses: heat, cold, wind, and wetness. 2. Clothing materials have different characteristics, as covered in Mitchell. Important points include: a. Cotton is almost useless for insulation when wet. b. Cotton "wicks" water; expose one part to water, and soon the entire garmet is wet. c. "Wool is warm when wet" and so are Fiberfill II, Polargaurd, Thinsulate fiberpile, but <u>not</u> down. d. Nylon (taffeta or ripstop) is wind-resistant, and breathable, but <u>not</u> waterproof. If nylon is coated, it is waterproof, but not breathable. e. 60/40 cloth, 65/35 cloth, Ventile cotton, and Army field jacket cotton are water-resistant, but not water-proof. f. Waterproof garmets do not let perspiration out, so condensation will cause wetness inside it. g. Gor-tex (micro-porous expanded PTFE, or polytetraflouroethylene) has pores of such a size that they will let water vapor through, but not liquid water. Thus Gortex is both waterproof and breathable; it is also very expensive. It doesn't breathe when there is water on it, however.	Blue jeans probably kill more outdoorspeople than rockfall, avalanches, and grizzly bears put together. Taffeta is uniformly woven nylon; ripstop has an extra heavier thread every 10 threads or so. "K-Coat" and "Super K-Coat" are the most common nylon coatings. Note that 60/40 parkas and field jackets are <u>not</u> considered raingear. Remind that about 1 Liter a day is lost through <u>insensible perspiration</u>; you don't have to work up a sweat to get condensation inside raingear.

VI. CLOTHING & PERSONAL EQUIPMENT

(10) A. CLOTHING

1. CLOTHING MATERIALS DIFFER IN THEIR PROPERTIES.

a. COTTON IS WIND-RESISTANT, WARM WHEN DRY, BUT (WATER-RESISTANT) IS CLOSE TO USELESS AS INSULATION WHEN WET. COTTON ALSO WICKS WATER; EXPOSE ONE PART TO RAIN, AND SOON IT'S ALL WET. (WATER REPELLENTS ARE FINISHES THAT PREVENT THE INSULATION)

b. WOOL IS NOT VERY WIND-RESISTANT, BUT IS WARM WHEN WET! ~~(BUT HEAVY WHEN WET, AND TAKES A LONG TIME TO DRY)~~ NOTE THAT WOOL CLOTHING IS ALWAYS A PART OF OUR GEAR, EVEN IN SUMMER; ILLUSTRATE W/ STORIES

c. SYNTHETICS (SUCH AS ~~FIBERFILL~~ DACRON, FIBERFILL II, POLARGUARD, THINSULATE, AND FIBERPILE) ARE ALSO WARM WHEN WET, AND

d. LIGHT WHEN WET, BUT NOT AS VERSATILE AS WOOL

e. DOWN IS VERY LIGHT AND WARM, BUT USELESS WHEN WET

f. NYLON IS WIND RESISTANT, BUT MUST BE COATED WITH WATERPROOFING TO BE WATERPROOF

~~g. GORE-TEX~~

2. THE 3 COLD/WET CLOTHING PRIORITIES ~~FOR~~ ARE:

THE 3 Ws: WINDPROOF, WATERPROOF, AND WOOL

a. RAINGEAR MUST BE WATERPROOF; 60/40 PARKAS, 65/35 PARKAS, VENTILE COTTON PARKAS, AND MILITARY FIELD JACKETS ARE NOT WATERPROOF. IT SHOULD BE EASILY VENTILATED, BUT NOT SO LOOSE IT GETS SNAGGED ON BRUSH, AND SHOULD PROTECT LEGS, NECK, AND HANDS.

~~b. WINDPROOF GEAR MAY ALSO BE RAINGEAR, BUT MOST RAINGEAR WILL CAUSE CONDENSATION AND DAMPNESS IN SLEEP.~~ (NOTE THAT THE SOAKING IS NOT NECESSARY FOR WETNESS INSIDE RAINGEAR; ~ 1qt./DAY OF PERSPIRATION IS INSENSIBLE.)

b. WINDPROOF GEAR IS IMPORTANT. ALTHOUGH WATERPROOF RAINGEAR IS WINDPROOF, CONDENSATION WILL OFTEN RESULT. WINDPROOF/NON-WATERPROOF SHELLS ARE VERY USEFUL IN DRY, COLD, WINDY CONDITIONS; A WIND SHELL WILL ADD MUCH WARMTH TO CLOTHING EVEN ON CALM DAYS. WIND SHELL JACKETS SHOULD PROTECT THE HAND AND NECK.

c. WOOL CLOTHING IS ESSENTIAL DURING

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	3. Outdoor clothing must be well-constructed. Good features include: a. Hoods-- the head and neck need much protection against heat loss. Hoods should be roomy, to fit over hats and helmets. b. Seams in raingear must be sealed with "seam sealer" compound. c. Fastenings must be useable with numb hands or with mittens on. d. Clothing must be roomy, to allow ventilation, movement, and additional clothing underneath.	Note the use of parachute cord loops on zippers.
	4. Sweat or other wetness destroys some of the insulating value of clothing. "Dress cold" while moving; ventilate to avoid condensation.	Note that it is the mark of an experienced outdoorsperson to stop frequently to adjust clothing, while a tenderfoot would just sweat, then freeze at the first rest stop.
	5. Use the layer principle; wear several thin insulating layers, instead of one thick one. Why? a. layers are more flexible, and make it easier to avoid over-heating and sweating. b. the layers trap air between them, creating better insulation than a single thick layer of the same weight.	Note that it is customary to wear several layers topped by a thin wind shell, and to put the wind shell back on after each change.
	6. Grease and dirt fill holes in clothing, destroying insulating value (much as water does). Keep it clean.	
	7. Two most common problems: a. No, or improper, raingear. b. Not enough wool.	
	8. Demonstrate and discuss some clothing items.	ADD VAPOR BARRIER PRINCIPLE: WEAR AN IMPERMEABLE LAYER NEXT TO SKIN. ↓ PERSPIRATION DUE TO HUMIDITY NEXT TO SKIN, EVAPORATION & WET CLOTHES ↓.

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(10)	B. Personal Equipment 1. Tents a. Should be rugged, light, and easy to set up. b. Should be waterproof on bottom, but breathable on top; a waterproof rain fly should be placed over the roof. c. A waterproof tarp or bag may be used as a bivouac shelter, but ventilation is a problem. d. Plastic tube tents are light and cheap, but cannot be closed at the ends without massive condensation.	Point out how this will prevent condensation.
	2. Sleeping Bags a. Must be light and compressable. b. Should not be kept stuffed; they must be stored fluffed to prevent damage. c. Should be warm; warmth is measured in loft: total thickness in inches. The loft should be fairly uniform; sewn-through seams will greatly lessen the warmth for a given loft.	Note that only down or synthetics such as Polargaurd appear to be good at the present; Fear and Mitchell discuss sleeping bags and other personal equipment in some detail.
	3. Pads Sleeping bags that compress well provi provide no insulation between a person and the ground. Improvised insulation, such as a pack, clothing, or climbing rope may be used, or a special pad may be brought for ground insulation. a. Air mattresses are comfortable, but convect heat to the ground. b. Open-cell foam is comfortable, but soaks up water like a sponge.	Air mattresses are not good in the winter, except special down-filled ones. (Expensive!) Open cell foam compresses just like a sleeping bag does, so it isn't very warm.

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	c. Ensolite and similar closed-cell pads insulate very well, even better than an equivalent loft of dry air. They are not compressable, but are thin and easily rolled.	Most experienced outdoors-people use ensolite.
	4. Stoves	
	a. Gasoline-fueled stoves are the only kind that are really effective in cold; a pump makes cold-weather starting much easier.	
	b. Stoves, especially gasoline ones, pose several hazards: -the overpressure relief valve may open, turning the stove into a ball of flame. -gasoline (or other volatile fuels) may cause instant frostbite if spilt on hands during refueling. -a stove burning with a yellow flame liberates considerable carbon monoxide gas.	The point is not to use a stove inside a tent.
	c. Alcohol stoves are compact and light, but don't develop much heat.	But may be appropriate for a QR pack; an alcohol stove is better than no stove.
	5. Light sources	
	a. Many search tasks and rescue tasks involve work that requires both hands and a light source; and e electric headlamp is necessary. Most members use the Justrite.	
	b. Past missions have required teams to searchmost of the night, so spare batteries and bulbs become a necessity.	Note that the lifetime of flashlight bulbs is about equivalent to that of most dry cells.
	c. proper selection of batteries and	

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	bulbs is important (see handout). For example, a pack of 2 Carbon/Zinc dry cells and a .5Amp bulb will only last about 1 hr. in the winter, a single lithium cell with the same .5 Amp bulb would last about 20 hrs. at winter temperatures. Of course, using a lamp that draws less current would decrease light but increase dry cell life.	At 0°F.
	6. Instep crampons a. Instep crampons are sets of spikes which may be strapped onto a boot, and wich fit into the instep. b. Surplus Army "creepers" which extend forward onto the sole somewhat are approximately equivalent. c. In some winter conditions, it will be impossible for a team to carry out search or rescue tasks with any degree of effeciency without such footwear for the entire team.	
VII ~~VI.~~ GENERAL SURVIVAL (10)	A. General 1. The following advice may seem to be unnecessary or obvious, but is still of major importance; there is noone in the Group who hasn't made a serious mistake by ignoring one at sometime in the past. 2. BE AWARE: don't let survival situations sneak up on you. Don't let immediate goals (e.g. finishing a climb) blind you to dangers. 2.5 CATCH IMBALANCES BEFORE THEY TURN INTO HYPOTHERMIA, DEHYDRATION, ETC.	

(ELAPSED) ACTUAL	CONTENTS	AV AIDS INSTRUCTOR NOTES
	3. DON'T OVEREXTEND YOURSELF. Know your limits and leave a safety margin. 4. Use your brain and the STOP mnemonic; don't let your reflexes do your thinking. 5. If you are going to bivvy, remember: a. it's easier to find a stationary target. b. make yourself obvious. B. Emergency Bivouacs 1. The primary requirements for shelter: shelter from wind and rain. 2. There are 2 sources of shelter: your environment and your pack. Look for places that a. provide some shelter immediately b. can be improved. In general, don't just depend on your pack. 3. Continue to improve your shelter with improvised materials and equipment from your pack as long as necessary. In general, dig down, but keep it well-drained. 4. Insulate <u>under</u> yourself; bark is an excellent insulator (better than wood). 5. If you <u>really</u> need to build a fire, a. pick a good location with reflector rocks or logs. b. gather enormous amounts of fire-wood, kindling, and tinder. c. spend a good bit of time laying the fire. 6. Carry spare food, water, clothing in your pack, and DON'T GET SEPERATED FROM IT!	Note that 2 leaf bags or a TMRU storm shelter will do the job. Note the psychological importance of improving the shelter continuously.