Dress for Success....Winter Success

Proper clothing has always been considered to be your first line of defense against the elements. Clothing is "your personal shelter!" In winter conditions, avoiding hypothermia, where your body core temperature cools to a dangerous level, is best accomplished by avoiding heat loss. This is where the layering system comes into play.

I like to think that layering clothing is similar to a dimmable light switch, sometimes you need a lot of light and sometimes just a little. Of course, types of fabrics, thickness of fabrics and how they are used in conjunction with each other, make layering a bit more complicated than a dimmable switch. This analogy, however, still rings true…sometimes you want a lot, and sometimes you want a little.

Let's begin by looking at the 5 heat loss mechanisms, as I teach in my wilderness survival Classes.

Conduction: Since heat travels from Hot to Cold (think of sitting down on a cold rock while taking a break in your hiking, the cold rock "sucks" the heat out of your rear). You can best avoid this mechanism of heat loss by placing a pad between your rear and any cold objects you might be sitting on. A sleeping pad below your sleeping bag insulates your warm body from the cold ground that is looking to draw heat away from your body.

Convection: With the movement of air, given the same temperature, you feel cooler with a breeze than in still air. This occurs because your body keeps a thin layer of warmth next to your skin. When a breeze comes along, it displaces this warm layer and now your body must regenerate that layer, this makes you feel cooler. Covering up keeps the breeze from attacking the warm layer next to your skin. In the summer, that breeze is certainly welcome!

Radiation: Like the feeling of warmth from a fire, even when it's several feet away, your body gives off radiation to space, from any exposed skin, Again, covering any exposed skin will reduce radiative heat loss.

Evaporation: You get out of the pool and temporarily feel chilled, your body is using its heat to eliminate the water on your skin (changing it to a vapor), thus making you feel chilled. This certainly works to our advantage in the summer as we sweat, and the body is using its heat to eliminate the moisture keeping you cooler. In cold weather, the key is staying dry and minimizing sweating. Water conducts heat away from the body 25 times faster than air!

Respiration: Warm moist air in our lungs is exchanged with the colder dryer air outside as we breathe. Not breathing would be counterproductive, so not much can be done other than breathing through a bandanna or such to warm the cloth as we breath out, thus warm the outside air as we breathe in through the warmed cloth.

The above are ways that we lose heat automatically, sometimes, without even realizing it.

Now on to proper clothing. When shopping at outdoor stores, it can get confusing seeing all the types of materials available for cold weather hiking. Most are designed, in one way or another, to help insulate and keep us dry by moving body moisture (sweat) away from our body. This moisture is moved to the surface of the material to evaporate as opposed to evaporating on our skin which would chill you. Different materials accomplish this in different ways. How you layer these materials also plays a factor in the insulative process.

On the racks, you will see, synthetic materials such as Polyester, Acrylic, Polypropylene and others. You will glance over and then see natural materials such as Silk, Wool, Merino Wool (less itchy than standard wool), and others. It can certainly get confusing. Some materials naturally wick (pull) moisture away from your body and some are chemically treated to wick moisture away from your body. Some are hydrophobic (water hating/repelling) and some are hydrophilic (water loving/attracting). Some materials need to be worn only right side out so the moisture is wicked "away" as opposed to wicking toward the body. As you can see, there is quite a bit of trial and error to find out what works best and is most comfortable for you. Also, to take into consideration, you might want to use different materials for different layers.

An interesting fact about wool. The properties of wool make it resistant to odor causing bacteria. Of course we get stinky on the trail, however your wool garment will become less stinky than garments made of most other materials.

This brings us to, why do we layer? On the rare occasion that my wife can talk me into visiting my in-laws, in winter, in the Northeast of the country, I quickly notice how they deal with cold weather. They grab a heavy coat, maybe a hat and go from their house to their car. They go from their car to the store or a restaurant the same way. This certainly works because the energy expended remains constant for the activities of daily life.

When I head out on a hike or backpack, not only can the energy I expend change (hard hiking, easy hiking, breaks) the weather can change as well! Each activity requires different energy output. Wearing a single heavy coat like my family on the east coast, simply would not allow me to properly regulate my body temperature given all those changes in activity and weather conditions.

The layering concept is quite simple. Layering will allow you to combine, remove and add pieces of clothing as conditions change. Hiking hard (or warmer conditions) will require less or possibly thinner layers than resting at camp or taking a break on the trail (or cooler conditions), which will require more or possibly thicker layers. The idea here is to keep your core temperature within a safe range. Don't overheat with too many layers while hiking hard and don't get too cold with too few layers when breaking at camp. Layering is your "dimmer switch".

Two Important "cold weather" benefits of the layering system are: First, the materials mentioned above move moisture away from your body to the surface of the material to evaporate as opposed to evaporating on your skin which would make you colder. Second, layering creates "dead air space" between the layers. Dead air space, in simple terms is, "insulative", this insulation helps to keep you warm.

Other considerations when selecting outdoor clothing:

•Fit - In cold weather you want snug fitting layers as this will help transport moisture away from your skin. In summer looser clothing will help with ventilation.

•Material thickness - Based on environmental temperatures as well as how your body runs (hot or cold), there are choices to be made regarding material thickness. Hiking in the winter in Alaska would dictate thicker layers than hiking in Southern California winter.

Regardless of weather and body type, the general principle of layering remains the same, what changes is the thickness/loft of the layers and the combination of layers (or lack thereof).

Layering allows you to add and subtract layers as conditions in weather and body temperature (exercise) change during your outing.

Layering basics:

I teach a "4-tier" method of layering. This does not mean there are only 4 layers involved, it simply is the basis of a system.

1) A "Base" wicking layer with materials and fit as listed above. This can be a solid piece or a 1/4 , or even a full zip item, that is personal preference, although a solid piece of clothing, typically Merino Wool is very popular. This layer moves moisture away from your body to evaporate outside of the garment as opposed to evaporating from your skin which would cool you.

2) A "Mid" layer provides insulative warmth and additional wicking from your base layer, sometimes Merino wool, fleece or other synthetics. 1/4 or full zip (full zip is easier to open and ventilate if you get too warm). Sometimes more than one "mid" layer can be used in colder climates to help "dial-in" your comfort level while active.

3) A "Warmth" insulation layer such as a puffy jacket (Down or Synthetic). This layer is normally used when stopped to camp or for a break, as it is typically too warm to hike with this layer on your body. Certainly not an absolute rule when it's extremely cold during your hike.

4) A "Shell" layer to protect against rain and sometimes wind. This layer, typically full or 1/4 zip, goes over your mid layer(s) while hiking in the rain or wind. It should be loose enough to fit over all layers, including your puffy jacket so it can be used at camp as well. Nice features on the shell layer beside a hood would be "pit zips" to help regulate body temperature and high pockets as low pockets may be blocked by your backpack's hip belt. A breathable membrane, such as

Gore-Tex allows moisture to escape from your body while blocking outside moisture from entering.

Your head, hands and feet also need to be taken into consideration while hiking in cold conditions. A beanie can provide warmth to your head, while a balaclava can provide warmth to your face and head. Gloves can be layered as well, and mittens are warmer than gloves (with reduced dexterity). Socks can also be layered to keep your feet warmer as well as prevent blisters.

Your experience will dictate how you go about layering for your adventures, however, here are some examples under different weather conditions. Remember to allow for your activity level and adjust as necessary.

• Sunny, warm, calm wind - Base layer alone

• Warm and Raining - Base layer with shell

• Warm, dry and windy - Base layer with shell (in this case your shell can be a "wind jacket")

• Sunny but cold with calm winds - Base layer with fleece mid layer. A full zip fleece will allow you to unzip to ventilate, if things warm up slightly

• Cold, windy and wet - Base layer, mid layer(s), shell. Possibly add some rain pants/kilt. If no longer hiking and at base camp, add your puffy warmth layer under your shell.

I could go on with many more potential combinations, however, the above should give you an idea of how to approach a proper layering system.

COTTON:
A quick word about cotton, as there is so much prejudice toward cotton in the outdoor industry. "Cotton Kills" this phrase is quoted over and over in outdoor books. One of the best quotes I have heard, is from outdoor and primitive skills expert, David Wescott who said, "Cotton doesn't kill, stupidity kills." Cotton is a wonderful material on a hot day because your sweat gets it wet, cotton remains wet for a long time....this helps cool us via "Evaporative Heat Loss." Not something you would want in winter, however. When I choose to use cotton to keep cooler in hot weather, I carry a wicking layer in my pack just in case of an unplanned night out.

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