LAYERING FOR COMFORT

Layering clothing is the best way to prepare for a variety of climates or exertion levels in your outdoor activities. With the right fabrics, weights and construction, you can maintain a comfortable balance between the heat produced by your body and its heat loss.

Layering is an old concept: wear multiple layers of clothing when it's cold; remove items when you're warm. The three essential layers - underwear, insulating and shell - can be combined to achieve maximum warmth when needed, or used separately or in different combinations, depending on the climate and your exertion level.

The first layer:

The first part of a good layering system is the underwear layer. Underwear provides basic insulation and pulls moisture away from your skin - moisture retained against your skin can chill you when activity ceases.

Underwear for outdoor activity is available in synthetic and natural fibers. **Synthetic** fabrics are designed to transport moisture away from your body along the surface of the fibers, keeping you dry and warm. Natural fibers include silk, wool and cotton underwear. **Natural** fibers generally do not transport moisture as efficiently as synthetics, but are good choices for warmth in low-exertion activities or just around town.

Different weights of underwear are designed to suit different activities. For high-activity levels, such as cross-country skiing, running or cycling, lightweight fabrics are best. Medium-weight underwear is best for activities that alternate rest with action, such as downhill skiing, hiking, or skating. For low exertion, and extreme cold weather activities such as ice climbing or mountaineering, choose expedition weight underwear.

While your activities should be a determining factor in what type of underwear you choose. also consider how cold you tend to get on average, and what the climate will be like.

The insulating layer:

Insulating garments provide additional warmth. Two categories of fibers are available - natural fibers such as wool and down, and synthetic fibers, which come as either batted fibers or pile fabrics.

Down is an excellent natural insulator, lightweight and extremely warm. Garments can be slightly bulky and can lose their insulating efficiency when wet, so a waterproof shell may be necessary if you wear down in a damp climate, Compressability is a hallmark of down - its ability to be packed into a small space is useful, for instance, if you plan to wear your down garment at a campsite, but not while hiking

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to that site, **Wool** is used in a variety of insulating garments, from caps to pants. Wool maintains a good insulating ability even if wet, and is breathable and durable.

Synthetics are man-made fibers, and provide good insulation even when wet. Some synthetics are manufactured in bats, or bundles of fibers, that provide a fill between an outer shell and inner lining (much like in a down jacket). **Batted fibers** come in thin or thick lofts. Thinner lofts allow a close fit to the body; thicker lofts are generally used for extreme cold weather garments.

Pile fabrics are made of a plush, non-pilling polyester fiber. They provide excellent insulation even when wet, superior breathability, and are quick drying. They are not windproof however, so they may require a windproof shell in cold, windy conditions.

The weights of your insulating clothing should be considered in relation to you planned activities and climates. High-exertion activities usually require lighter insulating garments than low-exertion, or those activities that alternate rest with activity. Also, consider how well the garment compresses to pack - you may not be wearing all your layers at all times.

Shell layers:
Shell layer garments provide a final step in insulating you against cold, act as protection frorn wind, snow or rain, or perform as the only layer for warm weather or high-exertion ativities.

Windproof/waterproof: Some shell garments are designed to protect you from wind and water. *Windproof* shells help prevent heat loss due to winds. They are generally lightweight nylons, such as Supplex, Silmond, Captiva or rip-stop nylon. Windproof shells generally provide some degree of water-repellency although they are not waterproof. *Waterproof* shells are designed to keep you completely dry in rain or snow They are usually nylon fabrics with a waterproof coating. Totally waterproof shells are best used for low-exertion times. when you will not need a breathable fabric.

Waterproof/breathable: Waterproof/breathable clothes are usually ajacket or pant made from material allowing moisture vapor (perspiration) to escape, and preventing water (snow or rain) from entering You can stay dry even if perspiring. Laminates and coatings applied to fabrics, or sophisticated weaving, techniques, are designed to provide basic waterproofing while allowing active users to regulate their body temperature, Waterproof/breathable garments generally have durable, water-repellant finish applied to their surface to make water bead up and roll off the fabric.

Construction is a key factor in any shell garment's performance in your layering system. Ventilation is crucial for active people - zippered vents help you increase breathability. Even the most breathable of fabrics will retain some moisture, especially when you are very active, so ventilation should be considered when buying waterproof/breathables.

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No item can be all things for all users in this category. If you'll be in a downpour, shells that are totally waterproof may be the best choice; for more active times you may need to sacrifice total waterproofness for more breathability. Your activity and the weather conditions should be your guide.
Waterproof/breathable garments control moisture to some degree, but can't completely prevent interior dampness if you're very active, Inside layers may retain some moisture, but proper layering will move that moisture away from your body, preventing chill,

Insulated shells: Shell garments can also be insulated, combining an insulating layer with a shell in one item. Insulated shells are less versatile than separate layers, and work best when you don't have to constantly adapt your clothing to changing activity levels or climate conditions.

Points to consider:
For added insulation value in a layering system, good fit is crucial. If you'll be wearing your shell in cold climates, it should allow room for your insulating clothing layers underneath.

Jacket wind seals should occur at the waist (internal storm skirts and draw cords), neck and sleeves. If a parka is too big, heat loss can happen rapidly. Look for sleeves that extend over the wrist, to trap in warmth. Pay close attention to how a parka or anorak fits around your neck. Windy drafts can reach the bare neck and chill you quickly. Internal knit storm collars, tunnel collars that seat around the neck, or various hoods with draw cords to pull close around the face work well. Pants should be loose enouqh to fit over insulating clothing if necessary but not allow drafts; legs with ankle zips can help with ventilation.

If waterproofness is your main interest, make sure that seams are factory sealed - needle holes in a searn can be large enough for water entry.

Warm weather: Shells are also the primary layer of clothing in warm weather, or very active times in mild conditions. For example, such items as cycling jerseys and shorts, running tights or cotton hiking shorts all function as outer layers. Even in warm weather, maintaining dryness is a key to comfort. Perspiration-soaked shirts or shorts can be chilling and clammy once you've ceased activity.

Most performance fabrics are designed to transport moisture away from your body, to evaporate on the outside. Clothing that fits close to take perspiration away from the body, and that allows body heat to escape, is a good choice. Nylon or polyester fabrics are designed to move moisture away from your body while drying quickly, keeping you comfortable in hot or humid conditions.

Source: REI - Layering for Comfort

Total insulation:

While you are planning the proper layering system for your needs, don't forget the rest of your body, sweaters can't compensate for heat lost through bare legs, and pants won't keep your head warm.

Pants are often neglected in putting together a layering system, but are just as important as a jacket for total warmth. A hat is important for staying truly warm and gloves, insulating socks that transport moisture, neck gaiters, balaclava hoods and headbands further insulate you from cold. With just a bit of planning, layering can keep you comfortable for all your outdoor activities,

Care and Cleaning:

Most items have detailed care tags relating to the specific fabric. Synthetic thermal underwear and wool or cotton/synthetic blends are designed for easy care, although some brands may not be machine dryable -- check the items care tags to find out. Silk should be hand washed and line dried.

Waterproof/breathable garments are generally designed for machine care - they should be washed with a mild powdered detergent and tumbled dry on warm setting. Most shell fabrics, usually nylons or polyesters, can be washed and dried by machine, and insulated garments with synthetic lofts usually by machine using a gentle soap, not detergent. Check your specific items' care tags for this information.

For down, use a mild soap on gentle setting, then remove the garment gently frorn the machine to air-dry. After it is dry, it may be put in a drier on heatless setting with some clean tennis balls to breakup the clumps. Wool clothing often requires dry cleaning but some items can be hand washed with gentle soap and air-dried.

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