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Layering Guide

Your cotton shirt is sweat-soaked, sending ice-cold rivulets trickling down your back. The howling wind is stealing every last remnant of your body heat. And your lips are so cold that you can't form a word. Then you take a look at your hiking companion, cheeks flushed with warmth, taking off a layer of clothing!

The great outdoors is a wonderful thing. But freezing temperatures, staggering winds and unpredictable weather can cause a misery so deep that, once you've experienced it, you'll never want to leave the comfort of the indoors again.

So what did your partner have right that you had so very wrong? He mastered the art of layering! With the right materials used in the right conditions, you can enjoy many outdoor activities despite the weather.

Don't let your clothes get outclassed by the cold. Learn how to withstand all that Mother Nature throws at you by investing in the proper layers.

The Basics

Layering is all about versatility and efficiency. Instead of dressing in one or two heavy items, layering involves dressing in a number of lightweight clothes that you can add or remove in response to changing conditions.

No matter what you're doing—skiing, snowshoeing, hiking, climbing—you need clothing that adapts to changing levels of activity.

As a rule of thumb, you should expect to be a little chilled when you start out the day and after each break in activity. During the first few minutes of movement, you will warm up. If you're wearing too many layers, you'll start out warm, but end up uncomfortable as your body temperature rises and you begin to sweat. When in doubt, wear your heaviest layer when you start your activity, but remove it at the first sign of overheating or perspiration.

Don't forget your precious extremities! Always pack a hat and insulated gloves if there's even a remote possibility of bad weather.

Peeling Back the Layers

Building layers is like building a sports team. Each player (in this case, each layer) performs a specific task. Circumstances—like weather and activity—will determine whether you need to use all the players on your team or sideline one or more of them around your waist or in your backpack.

Bad analogies aside, there are four layers you need to consider when embarking on an outdoor adventure.

Base Layer

As the next-to-skin layer, the base layer is extremely important. Base layers transfer sweat away from your skin, and send moisture, in a process known as "wicking", to outer layers where it can evaporate. Consider your level of activity and the temperatures you expect, and choose your base layer accordingly. The bullets below offer general guidelines, but you should always consider your own tolerance of cold when choosing a base layer. Generally, it is better to be too warm than too cold.

- Lightweight is best for cool to cold temperatures with high levels of activity like running, climbing, cross-country skiing, strenuous hiking, etc.
- Midweight is best for cold weather for medium levels of activity like walking outdoors, or activities where you will be stationary some of the time, but moving at other times
- Expedition Weight is the choice in extreme cold conditions at any exertion level, and stationary activities in cold to extreme cold conditions require Expedition Weight base layers. If you are engaged in activities where you must remain still for extended periods (as in hunting, ice fishing, wildlife observation and photography, operating equipment, work environment, etc.) choose Expedition Weight for the most insulation and warmth.

Mid Layer

Insulating Layer

Outerwear or Shell Layer

Base Layer

The base layer, as the name implies, will be the first layer of clothing you put on. For outdoor activities, it's likely that you'll be perspiring and cooling down repeatedly, so you need items that will cool you down quickly, but also prevent after-exercise chill. The base layer should never retain moisture, but should wick it away. It should also:

- Be worn right next to your skin.
- Fit tightly.
- Wick moisture away from the skin to provide a layer of insulation.
- Be worn in moderate to cold conditions when insulation is needed.

Base Layer Materials

Base layer clothing is worn right next to your skin. on the top, bottom, or both. The purpose of this first layer is to wick moisture away from your body during high intensity activities and to provide some insulation in cold weather conditions. Base layers are available in varying degrees of warmth.

Polyester/Polyester Blends

- High-tech materials such as CoolMax® or Polartecr Power Dry®.
- Breathable.

- Moisture-wicking.

Cotton

- Comfortable when dry, but tends to absorb and retain sweat which leads to heat loss.
- Dries slowly.
- Not recommended for use in cold conditions or when engaging in high energy activities.

Polypropylene

- Efficiently wicks sweat away from the skin.
- A durable polyester-based fabric available in many weights.
- As comfortable as cotton.

Capilene®

- Another comfortable polyester-based wicking fabric that is chemically treated to help spread moisture throughout the fabric so it evaporates more quickly.

Silk

- Effective wicking and insulating fabric.
- Comfortable and lightweight, but not as durable as polyester-based fabrics.
- May require special care (see care label).

Moisture Wicking

Some clothing layers pull sweat away from the surface of your skin (wicking). The moisture then quickly dries or is transferred to other clothing layers. Clothes that wick away moisture keep you cool and dry in warm conditions and reduce conductive heat loss in colder weather. Wicking garments are made to be worn close to your skin as a base or a mid layer.

Often you will see garments referred to simply as moisture wicking. These garments are usually made of one or a combination of high-tech fabrics. Look for blends of:

- Spandex
- Polyester
- Nylon
- Lycra®

Mid Layer

If you need minimal protection outdoors, layer lightweight, functional pieces over your base layer. The mid layer:

- Consists of everyday items like shorts, tee-shirts, and lightweight pants.
- Provides insulation and protection in mild conditions.
- Is often worn alone on short outings in good weather.

- Is designed to be lightweight and durable.

Mid Layer Materials

The mid layer consists of the lightweight, comfortable, and durable clothing you wear every day. This layer provides some protection in warm conditions.

Cotton

- Can be worn during warm-weather, low-intensity activities.
- Is a less-than-optimal mid layer for the same reason it makes a less-than-optimal base layer.
- Retains all moisture and takes a long time to dry.

Wool

- A natural insulator.
- Good for use in moderate to cold conditions.
- Can become bulky when wet.
- Can be found in long-sleeve shirts, pants, sweaters, and jackets.

Nylon

- Great for use in shorts, pants, and shirts.
- Lightweight, durable, usually non-absorbent.
- Available in a variety of styles for both warm and cold weather usage.
- Comfortable against skin.

Moisture Wicking

As with base layer garments, mid layer clothing can be made of high tech fabrics like spandex, polyester, or Lycra®.

Insulating Layer

The purpose of the insulating layer is to retain your body heat by creating a pocket of warm air around your body. The insulating layer:

- Is designed specifically to provide warmth.
- Is worn when mid and base layers do not provide enough warmth for the weather conditions.
- Should be warm, lightweight, and non-bulky.
- Should breathe well to let moisture and body heat escape.

Insulating Layer Materials

Insulating garments, both tops and bottoms, are usually made of polyester fabrics that are treated in a way that makes the fibers stand up and trap air. This trapped air then forms a protective

insulating layer. Look for products featuring Gore-Tex® Windstopper®, Polartecr WindPro®, or Polartecr Classics® technologies. The most popular insulating fabrics are:

Fleece

- Available in a variety of styles and thicknesses.
- Warm when wet.
- Lightweight and fast-drying.
- Transports moisture away from the body.
- Sometimes comes with wind-stopping liners built in.
- Available in pants, pullovers, jackets, vests, and sweaters.

Pile

- Similar to fleece with fibers that stand up densely on the surface of a garment and trap air.
- Has a plush feel.

Wool

- Is a good natural insulator, even when wet.
- Can take a long time to dry and is bulky to wear.

Outerwear/Shell Layer

The outer layer is your final layer. Outerwear pieces vary in weight, water resistance, and breathability so make sure to buy the appropriate garment for your activity level. The outer layer:

- Consists of tops and bottoms that should protect you from wind and weather.
- Needs to be somewhat breathable to let moisture and body heat escape.
- Should always be carried with you no matter what your activity.

Outerwear/Shell Layer Materials

The purpose of the outer or shell layer is to protect your whole body from wind and precipitation. (The outerwear layer includes both tops and bottoms.) When properly designed, the shell layer holds in your body heat while allowing moisture to escape. If wind or water is allowed to penetrate your inner layers, they will be ineffective. And without proper ventilation, inside moisture can't evaporate and, instead, will condense inside your shell. That said, picking the right outerwear for the weather and your activity level can be tricky. Here are some guidelines to keep in mind.

Remember that for anything more than low-intensity activity, your outerwear needs to be breathable and well ventilated. This layer should also comfortably fit over the rest of your layers without being so bulky that it restricts your movement.

Outerwear is generally made of tightly woven fabrics which are coated or laminated to be waterproof. Many outerwear pieces feature technical panels that act as barriers against wind and

moisture. Other details, such as stretch fabrics, vents, and zippers, add to a garment's overall functionality. Look for outerwear in the following constructions:

Water Resistant and Breathable

- Used in mild weather or light precipitation.
- Used during high-intensity activities.
- Made with tightly woven materials (like ripstop nylon) that block wind.
- Treated with water-resistant finish so moisture rolls off.
- Pieces are generally lightweight.

Water-resistant breathable outerwear tends to be less expensive than fully waterproof pieces. However, water resistant outerwear is not waterproof so if you plan to be outside during harsh weather or extended periods of rain, you'll need something that will offer more protection. Water-resistant breathable outerwear is appropriate for use in warmer conditions where breathability is essential and the possibility of heavy precipitation is low.

Waterproof and Breathable

- Keeps you comfortable in various weather conditions and during most activities.
- Suitable for wet, cold climates and alpine activities.
- Made of popular waterproof, breathable fabrics like Gore-Tex®, North Face's HyVent®, Marmot's PreCip® and MemBrain®, Helly Hansen's HellyTech®, and Mountain Hardwear's Conduit®.

Waterproof, breathable fabrics perform well in a wide range of weather conditions and new high tech materials are being introduced all the time. However, even these materials can heat up and trap moisture during very strenuous activities. A garment's performance depends on the specific fabric used in the construction, the temperature outside, and the intensity of your activity.

Waterproof and Non-Breathable

- Made of a durable, polyurethane-coated nylon.
- Waterproof and windproof.
- Used during light activity in heavy precipitation.

Waterproof non-breathable outerwear pieces are, as the name implies, completely waterproof, and are generally less expensive than waterproof, breathable garments. However, because they provide very little breathability, they are uncomfortable in the heat or for use during high-intensity activities. Waterproof, non-breathable materials are usually used in the construction of inexpensive rain pants or emergency ponchos.

Outerwear Design and Construction

Once you've decided on fabric, there are a few other factors to consider when purchasing outerwear. Compare the included design features of tops and bottom in a few different models. Look for the following:

Vents

- Enhance breathability in all fabrics.
- Can be small or large with large ones being more effective but also more likely to allow moisture in.
- Take the form of mesh-lined pockets, underarm openings, side zips.

Fit

- Should fit comfortably over all other layers.
- Should not be too bulky that you can't cinch it completely in bad weather.
- Should allow for a full range of motion.

Accessibility

- Jackets and pants that zip are easier to put on than pullover models, but zippers may increase the chance for leaks unless you invest a little more and get welded waterproof zippers.
- More pockets mean more room to store gear.
- The waist, wrist, and neck areas should adjust to seal out the weather, but open easily for ventilation.
- Look for a model with a detachable hood for a quick change in bad weather.

Sealed Seams

- A must for all waterproof gear.

Stretch Panels

- Flexible stretch panels under the arms and across the shoulders in jackets and across the knees in pants will increase freedom of movement for maximum mobility.

Hard Shells vs. Soft Shells

For many years, hard shell garments were your only outerwear option. These pieces are completely waterproof. Gore-Tex is the classic, most ubiquitous hard shell material. When the weather is truly foul, nothing else will keep you as dry. However, they can be noisy and slightly rigid.

The new category of outerwear-soft shells-is based on soft, stretchy fabrics that are water resistant. Soft shell outerwear breathes much better than hard shell garments allowing water vapor to escape during exercise. However, soft shell pieces aren't meant to be worn in extreme moisture. They can fend off a mild spring shower, but they're no match for a downpour.