

Trekkers' Guide to Wilderness Navigation

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Although it's easy to prevent, thousands of hikers get lost every year, even those who start their treks on clearly marked trails. In a mega-disaster, the stakes may be even higher as you search for safe refuge in a state park or wilderness area outside the city. This in-depth tutorial will get you up to speed on the skills, techniques and tools used by experienced travelers to stay on course, blaze new trails, cover long distances and self-rescue in an emergency.

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Note: Only Part 1 is included in this excerpt. The rest of the tutorial is posted online.



Orientation Skills

While it's tempting to daydream and flip on autopilot along designated trails, too often these routes turn hinky the farther out you go. Trail markers disappear and sometimes the path itself - in rockslides, snowfall, beneath thick brush and mud puddles, or as the result of poor maintenance. In some circumstances, you may even want to avoid known trails and roads due to security concerns.

By learning navigation skills, you can organize miles of unfamiliar terrain into an orderly system of



corridors, bridges, gateways, dead ends and danger zones. It's also a good idea to get in the habit of exercising good situational awareness wherever you travel. Here are five aspects of this skill:

First, stay anchored in the world around you by monitoring your cardinal points. On a sunny day, it's easiest to orient yourself to the southern horizon, since the sun crosses that part of the sky from mid-morning to mid-afternoon. Remember, whenever you change directions, the sun will move, too. So take a moment to reorganize the terrain relevant to your new position.

Second, keep track of time as you move from point to point. If possible, have a notebook handy and jot down travel times, along with other pertinent details. If, for instance, you walk north for half an hour, then turn northeast, make a note of it. On the return trip, you're liable to be tired and more likely to stray off course, so the notes will help you anticipate your turns and know when you've passed key landmarks or intersection. The notes will likewise allow you to accurately budget the available daylight.

Third, activate all six of your senses on the trail and be on the watch for anything unusual. Notice distinguishing features in the terrain, like water vapor rising from a lake you can't quite see; a dead tree still standing; the steepness of the trail; pasture fences and other manmade structures. If the foliage gives off a pungent odor, remember that smell. Feel which way the wind is blowing. Be on the lookout for resources you may need in a pinch, like pine resin or birch bark for making a fire, edible plants, game trails or water sources. And don't fret at the annoying sound of a nearby highway. In an emergency, it may become your lifeline.

Fourth, when you can see for any distance, stop and let the view sink in. Memorize principle landmarks and look for signs of human habitation. Perhaps a wall of clouds is approaching from far off, bringing a storm. Along ridges and at high elevations, notice the lay of the land below, especially steep

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slopes, loose gravel and canyon bowls with no outlet. Just as a pathway through the wilderness can save your life, a dead end can be your undoing.

Fifth, if you're making a roundtrip, stop and look behind you every so often. You may not see Bigfoot on your tail, but this is the view you should expect to see on the way back. Make a mental note of area landmarks as seen from this perspective.

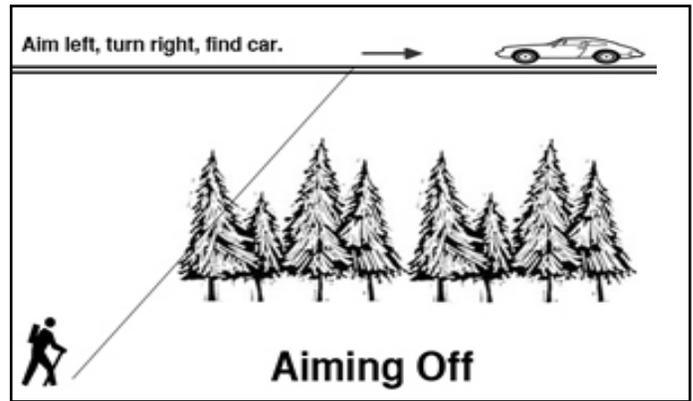
Along with situational awareness, experienced travelers employ various orienteering techniques to keep from getting lost. Some are common-sense tricks of the trade. Others navigators use simple geometry to roughly measure the landscape, calculate distance and estimate their current position within the larger area.

For example, the road where you park your car at a trailhead, when it runs more or less straight, can be used as a baseline. A river, railroad tracks or an electrical transmission line can serve the same purpose. Travelers use these baselines as handrails when they hike alongside them. If you trek directly away from the baseline, it becomes a lateral, basically an impossible-to-miss guidepost on the route home. If you've pitched your tent near a river, or parked your car on the road, then no matter how far you stray off course, you're bound to run into the lateral because of its length and distinguishing features.

The only question you'll have when you get to this signpost is which way to turn. "Aiming Off" is a technique that takes the guesswork out of this decision. On the return journey, by intentionally veering too far to the left or right -- i.e. aiming off -- you'll know exactly in which direction the car or camp resides. Make sure your angle of deviation is wide enough so you won't accidentally veer back the other way and hit the lateral on the wrong side. If that happens, at the turn you'll be heading away from your destination instead of towards it.

One factor to consider here is our natural inclination to veer off a straight course because we're right or left-handed. The stronger side of our bodies pulls us off into that direction. This is why hikers so often wander in circles once they get lost. So it's better to aim off in the direction you'd naturally veer. For most of us, that means to the right. In some cases, however, the terrain is easier going on the left side. When that happens, simply increase your angle of deviation to compensate for being right-handed.

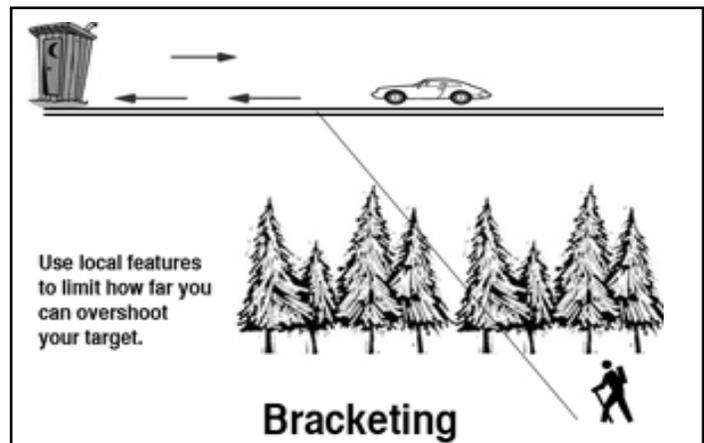
When traveling, use dead standing trees and other anomalies in the landscape to box in your overall theatre of travel. This technique, called "Bracketing", will limit how far off track you can go before real-



This technique takes the guesswork out of deciding which way to turn when you reach your lateral.

izing something's wrong. For instance, if there's an outbuilding on the side of the road a quarter mile east from the lot where you parked your car, and a stack of boulders a hundred feet to the west, that information will save you if it's dark out. If you're coming from the west, you'll know you're getting close when you pass the boulders. If you overshoot the car anyway and continue moving east, the outbuilding will tip you off that you've gone too far.

Bracketing also works on a larger scale. Make note of visible peaks and other landmarks that sur-



Landmarks provide borders to limit how far you can veer off course.

round your overall travel corridor. That way, if you start straying out of the area, you'll know it, because one or more of those landmarks will have shifted significantly or disappeared altogether.

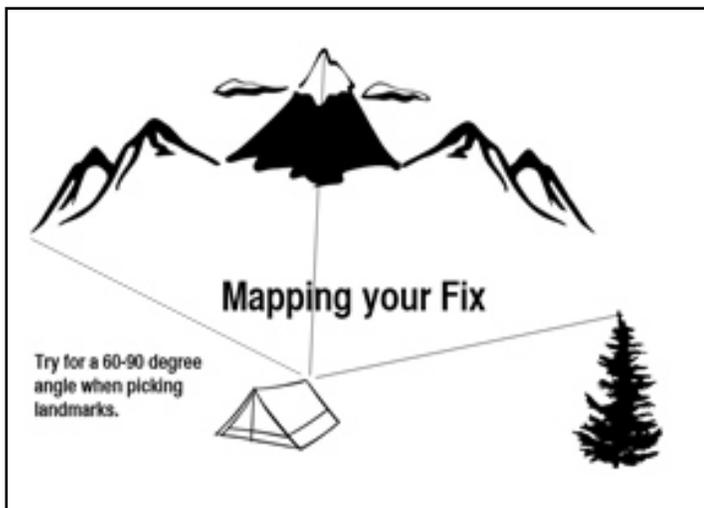
You can also identify your exact fix on a map, using the same distant landmarks. If you're trying to decide where to stop for lunch, or how much longer until you reach a water source, you can pinpoint your location in the field by finding the landmarks on the map. Draw a line from 2 or 3 of these spots towards

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your location. Where the lines intersect represents your fix. This technique, called triangulation, is based on the principle that two straight lines cross each other at only one point.

Triangulation works best when the angle of the intersecting lines is close to 90 degrees, and no smaller



Landmarks provide borders to limit how far you can veer off course.

than 45 degrees. To get close to a right angle, face your first landmark and extend one arm toward it, then point your other arm, towards a second landmark. Using your body as a protractor is a convenient way to measure out angles. You can also, incidentally, draw your own map using triangulation.

Lost and Found

Besides keeping you on course, navigation techniques will help you when you're lost. Many hikers who stumble into unknown territory inevitably compound their plight by aimlessly wandering further offcourse. In the process, they expend precious energy and become vulnerable to hypothermia, dehydration and joint injuries. Even worse, they often end up outside the initial perimeter set up by search and rescue teams.

Experienced travelers stop at the first sign of trouble. If it's late in the day, they scout out a good spot to bivouac overnight, then make a fresh start in the morning. While a speedy rescue may seem like the highest priority, personal safety and protection should always come first. That may mean building a shelter and a fire, constructing a makeshift spear or other weapon, and getting some rest.

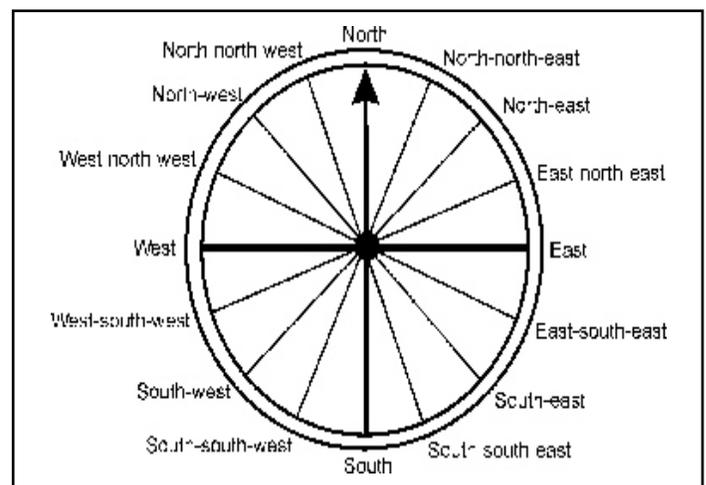
A sleepover may not work under some scenarios.

In cold conditions, a quick descent in altitude may be necessary. Bad weather, a wounded companion or dangerous wildlife may also necessitate a speedy exit. Before leaving the high country, however, take advantage of the elevation to work out your escape route downhill. (If you're lost in low-lying terrain, climb a tree if it's safe to do so and scout out the area.)

Keep in mind that old-growth forests contain less foliage than areas with younger trees, enabling you to move more quickly through them. The snow levels should also be lighter, and you'll have better protection in the case of an avalanche. Big trees are not likely to fall from the force of the debris, snow or rock rushing through.

If you're trying to pick up a trail you think is nearby, search the area in semi-circles, as if you were walking around the seats of an amphitheatre. Consider the stage your command post. On the first trip around the theatre, count out 100 paces to the left of the stage, then start the semi-circle.

If that parameter doesn't turn up anything, return



Memorizing the position of major cardinal points on a circle will help you navigate even when no compass is available.

to the stage, double the number of paces left and try again.

If you're moving in a specific direction and don't have a compass to take a bearing, one trick for staying on course is to look 50 feet (or 50 yards) straight ahead and line up two trees, one behind the other, that lie on your imaginary line. When you reach the second tree, repeat the procedure, lining up two more trees.

A technique for tracking your overall progress is to build little rock piles, known as cairns, as if they were a trail of bread crumbs. Some trekkers prefer to

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cut blazes into trees. Place an arrow on the side of the blaze that represents your forward direction of travel. You can also cut up a piece of cloth into ribbons and hang these on branches. Whatever signal you use, make sure it can be seen as you approach the spot from different directions.

In some cases, staying put long term and waiting for a rescue may be the best course of action. Have a signal fire ready to light, a mirror you can shine into the sky, or create noticeable markings on the terrain that can be seen for a long distance. But if you suspect that no one will notice you're gone, self-rescue must be undertaken so long as weather conditions allow it. Even with no map or compass, you can still plot a course and follow it using baselines, bracketing and the other techniques you learn in this tutorial.

Drawing a Map

It won't hurt to document your progress as you travel through uncharted terrain. You can use landmarks and angles to draw one or more maps. Perhaps your current fix is a place you'd like to return to camp or fish or recover buried treasure. In a survival situation, you may have to leave an injured companion behind in a makeshift shelter while you go fetch a rescue team. Taking time to draw your surroundings in relation to visible landmarks will make re-locating the spot easier, especially if you end up injured yourself and can't lead the expedition.

Also try to estimate distances on your map. A quarter mile, for instance, is 437 yards, or about four and a half football fields. If you jog, you know that one lap on a running track equals a quarter mile. Four laps equal one mile, and one mile is 5,280 feet. If one human pace equals five feet, it will take 264 paces to cover that quarter mile.

It's also helpful to learn the metric system, since

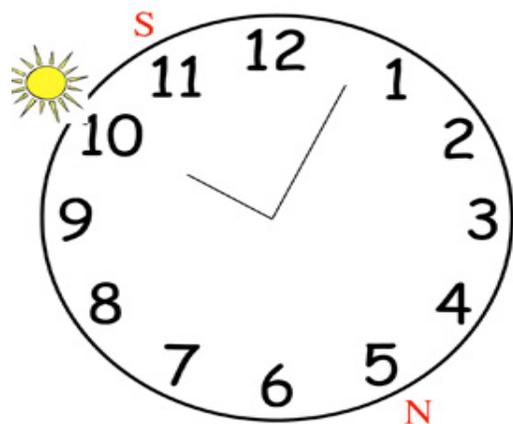


Use landmarks, baselines and other clues when drawing your map. Don't forget to estimate distances and identify where North is.

conversions from meters and kilometers is a snap compared to working with feet and miles. Besides that, all maps published outside the United States use the metric system. 1,000 meters equals a kilometer. One kilometer is equal to five-eighths of a mile. A meter, of course, is just a tad shorter than a yard. So two meters would equal one pace.

If you're a bad judge of distance and didn't count your paces, just draw the landmarks and your fix on your map so they're roughly proportional. If that's not possible, write notes in the margin indicating, for example, that one landmark is twice as far away as another. You can use your fist and fingers to eyeball proportional distances. Also write down an estimated travel time between any two points on the map, if you know it. In fact, any clue that helps organize the terrain is worth writing down.

If your makeshift shelter is hidden in a forest, your fix might be the point when you first enter the trees, since it's at this spot that you can line up landmarks and triangulate a fix. From there, identify the direction of travel into the woods, noting any laterals, anomalies or other features to watch for.



If the time is accurate, you can use a wristwatch to determine South. South is always halfway between the 12 and the hour hand, when the hour hand is pointed in the direction of the Sun. North can now be deduced, since it's 180 degrees, or in the exact opposite direction of South.

Don't forget to identify North on your map. When rescuers reach the general theatre of travel covered by your drawing, the first thing they'll want to do is orient the map you drew for them to the terrain. So place a big N on it somewhere with an arrow pointing northward.

If you don't have a compass, you may not be able to discern your cardinal points. But as we've seen, is important to figure out which direction is which. Like building a fire, you should learn a few different

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ways of determining due North.

One is to use the current time on your watch and the Sun to establish due South, or exact South. If you have an analog watch, point the hour hand at the Sun. Halfway between this point and the number twelve is due South. Now make an about face and you'll be facing due North. If you only have a digital watch or cell phone, you can still use this method. Just draw a clock face on a piece of paper, adding the second hand where it would be on an analog watch. Your circle should be proportionally accurate, with the relevant numbers spaced evenly around number twelve.

You might assume that the sun invariably rises due East and sets due West, making it a snap to identify due North. Yet it's only on the Autumn and Spring Equinoxes, when daylight and darkness are exactly the same, that this holds true. During the winter months, the sun pokes up more towards the southeast and sets in the southwest. That's because the North Pole is tipped away from the sun. In the summer months, when the North Pole is tilted toward the sun, it rises in the northeast and sets in the northwest.

On a cloudy day, look to the terrain for signs of north and south. Moss tends to grow on the northern side of rocks. Wildflowers don't grow as well on the northern side, except in late summer in the high country. Snowdrifts pile up more thickly and take a much longer time to melt on the northern side of rocks and other shaded terrain.

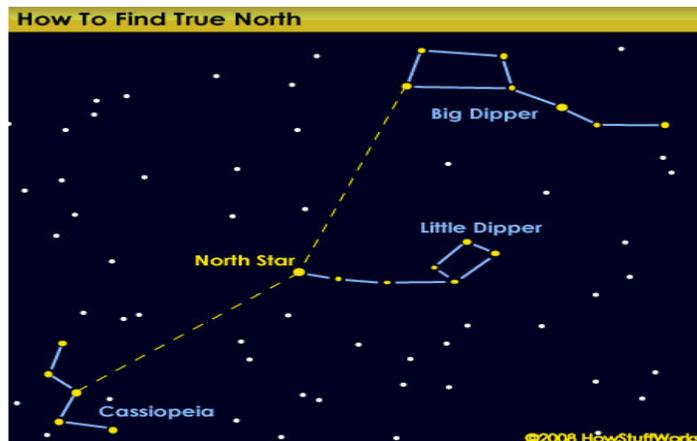
If it's nighttime, you can identify true North by locating the star Polaris. Since the North Pole points to it, Polaris always sits in the same place in the sky above due North. To pinpoint it, look for the Big Dipper. The two stars at the front of the ladle line up so that they point towards a relatively empty portion of the sky. At the center of this area is Polaris.

If the Big Dipper is not visible, just look to the right of where the sun set that day. That's the northern horizon. Extend one arm towards the horizon and the other skyward, at an angle between 30 and 45 degrees, if you're in the United States. Now canvass the sky with your upward pointing arm until you spot the brightest star in this area. Polaris is not that bright, but brighter than other stars in the vicinity. It also marks the first star on the handle of the Little Dipper. Once you've located it, you can mark a north-south line of trajectory on the ground. Use two rocks and a stick, or draw a line through the soil.

If you forget to label which end is North, in the morning, if the sun rises to the right side of the stick,

then North is at the top. If it rises to the left, then label North at the bottom of the stick (from your perspective).

If you're not carrying a compass and want to improvise one on the fly, find a steel pin or needle and rub it several times with a silk or synthetic cloth to create a static charge. Rub the needle from the bottom up only, not back and forth. You can dangle your needle in the air by a thread, or float it in still water, using something other than a steel-based container. An aluminum can is fine, since aluminum has no iron in it. Copper is also OK. Most sewing needles



The North Star (Polaris) never moves in the sky, while the constellations rotate around it.

and pins are made of stainless steel. Keep it level, or parallel to the ground. Test your improvised magnet a couple times to make sure it lines up in the same place. Then mark the direction on the ground as your north-south line.

For the full navigation tutorial, please visit the following web page:

<http://www.thecityedition.com/2012/navigation.html>

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