

Tents and Shelter

The kit to reside comfortably outdoors

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<http://www.fraw.org.uk/outdoors/> ebo@fraw.org.uk

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The most important element of living outdoors is having the right kind of shelter: a waterproof layer – the tent – and an insulating layer to let to sleep comfortably – your bedding. It's also important to organise these elements in a way that's simple and functional. This unit examines how and what to put together to enable you to live comfortably outdoors.

Comfort by design

Nature has equipped humans with a wonderful waterproof layer – *our skin*. The problem is that over the past few tens of thousands of years we've lost the hair which kept us warm and so: in the world's cold and temperate zones humans have developed insulating shelters to survive the cold; in the wet tropical zones, where rain can chill, we've developed cool but watertight shelters; and in hot sunny climates, where our skin can burn and we dehydrate easily, we've developed cool shaded shelters. In Britain our traditional shelters were solid stone or rammed soil, to provide the mass to hold heat in the Wintertime but which are also cool in the Summer. In ancient Britain people lived in caves but they also lived in huts, like the lodges and wickiups of the Native Americans, roofed with animal skin or bark.

Today when we go camping we have tents made of fabric, like the nomads and tribal peoples of the Middle Eastern and Central Asian deserts, which although cold are mostly dry too. Unfortunately in Britain we don't have such a dry climate and so at many times of the year people go camping and get damp and miserable. Understanding how to live comfortably outdoors in our damper climate is therefore all about learning to modify your "tent system" to deal with different climactic conditions. Cold is not the same as wet, and wet and cold together is not the same as either cold or wet individually – and adding wind to either is just bad news!

The basic tent

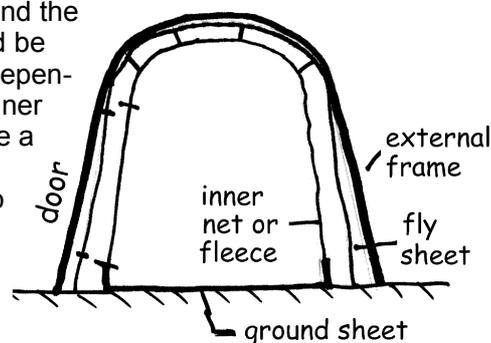
The 'Great Outdoors' initiative isn't about hypothetical survival – it's about living outdoors. For this reason we'll assume that you have at least decided to get a tent (but we may cover emergency and other types of "fun" shelter in a subsequent unit).

The tents that you can buy from High Street stores and supermarkets vary in quality, but they all have the same basic design. There is a frame of stiff or flexible rods which usually sit outside of the structure. There's an outer waterproof layer – the fly sheet – and an inner porous layer – the net – which is designed to keep the bugs and biting insects out (which in better quality and cold weather tents is made of an insulating fleece material). There's also, ideally sown in to stop the ants and beetles feeding on you whilst sleeping, an impermeable ground sheet. It's actually quite useful to have the ground

sheet connected to the net some distance off the surface (say 4cm to 10cm) because if you get a rush of water across the soil in a downpour it stops your sleeping area turning into a pond.

If each of these elements are to work properly you have to help them:

The frame and the flysheet should be assembled independently of the inner net. If you have a tent that requires you to get the net out of its waterproof bag before you've got the waterproof



got the waterproof fly sheet up, stretched and pegged to the ground, get rid of the tent! (e.g., old fashioned ridge tents where the inner tent is put up first and then the outer fly sheet goes on second). The whole idea of putting the outside up first is that, even if it's the monsoon, when you erect the inner layer you should be able to fit up within a weatherproof space to keep it dry.

Next the inner net or fleece, to stay dry, needs to be well clear of the outer fly sheet otherwise it will get damp – and under the worse conditions water will seep from the fly sheet to the net, down the net and then pond inside the impermeable ground sheet. Even if it's not raining, if the air outside the tent is cold enough the moisture from your breath can condense on the inside of the fly sheet.

The ground sheet might be impermeable but that does not mean that you won't get wet. When we sleep in a tent we must have a mattress or foam bedroll to sleep upon. This isn't just for your physical comfort, it's to stop you getting cold. The soil is cold and so the heat from your body is conducted away to the ground. At the same time the moisture from your body will condense on the cold ground sheet, and so covering it with an insulating mattress prevents a clammy damp layer from forming under your body.

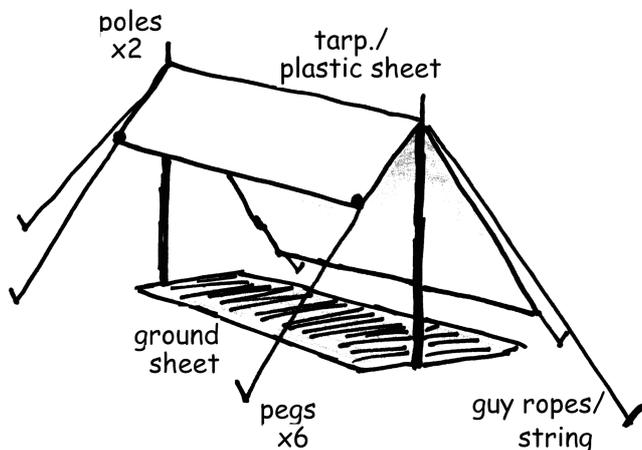
Finally, it's important that your tent is big enough for you to lie in and move around easily. If you are 5' 9" and the inner net/ground sheet of your tent is 5' 10" you're bound to run into problems – most likely you'll keep pressing the net against the fly sheet in your sleep. Make sure that there's always a good

clearance between your head and feet and the side walls of the tent. If there's more than one person in the tent make sure that when you're side-by-side there is also plenty of clearance to allow you to move around without pressing the net onto the fly sheet.

Tents are for sleeping, not living in!

A tent is made to keep you dry and warm. It's not a kitchen or a common room. When camping we have different functions and, for the sake of doing each well, we need to keep them separate. For this reason when you camp you should always have a second shelter to sit, cook and eat under without getting wet from above or wind chilled from the side. Your tent should exclusively be somewhere to sleep and in the worst circumstances keep warm.

Making a "cook tent" is not an elaborate process. Quite literally it's a couple of poles, a large tarpaulin (or tarp.) and some string for guy ropes. In a woodland you can do without the poles by running string between two trees, but leave some slack or the movement of the trees will snap the string in a storm.

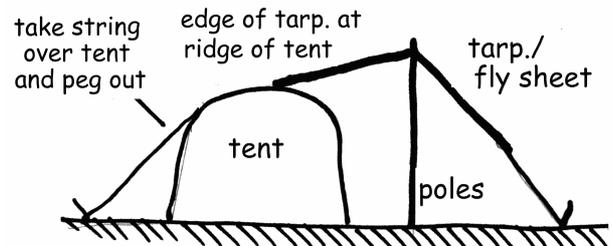


When stringing up a tarp, the temptation is to rig it symmetrically, like an old fashioned ridge tent – ideally *don't* (unless the weather's really bad and you need the extra shelter). The purpose of the cook tent is to provide shelter from the wind and rain but you still need easy access at all times, so rig the ridge off-centre and bring one side down to ground level. If symmetrical, to bring both sides to the ground means that you'll have next to no head room. When rigged off-centre you should get at least 5' of headroom when one side touches the ground.

The figure above shows the 'long' side of the tent coming flat to the ground, but there's no reason that you can't fold and peg the corners in towards the middle to provide shelter from the sides. If you follow this process far enough you can end up with both poles fixed to one side of the tarp., tensioned diagonally to keep them apart and holding up the tarp. – this allows you to bring the sides right in making a well sheltered space. However, when you fold around the sides, in windy weather you still need to provide a small gap opposite the 'door' side to stop the whole thing taking off in the wind. Better still, if the wind shifts significantly take down and re-erect the tent to keep the 'long' side into the wind.

If the weather's really awful you can rig the cook

tent as an extension of your sleeping tent. The only problem with this approach is that it puts extra loading onto the top of your main tent, so check if the tent can take it without deforming by practising this approach at home first. The ridge of the cook tent should be strung cross-ways (perpendicular) to the door of your tent. You then put the 'long' side of the cook tent facing away from your tent and you get shelter from both sides. The important detail is that the edge of the tarp. must be rigged just beyond the mid-point of your tent's roof so that the rain is shed down the far side of the tent, not over the door!



A useful addition to the cook tent is a ground sheet. The main purpose of this is so that you can sit down and put things on the ground without them getting wet and muddy. Mud will slowly accrete to the ground sheet in wet weather so it's always a good idea to have a 'no boots' policy inside the cook tent – but rarely do you need to take off your boots as you can usually sit with your feet just off the sheet.

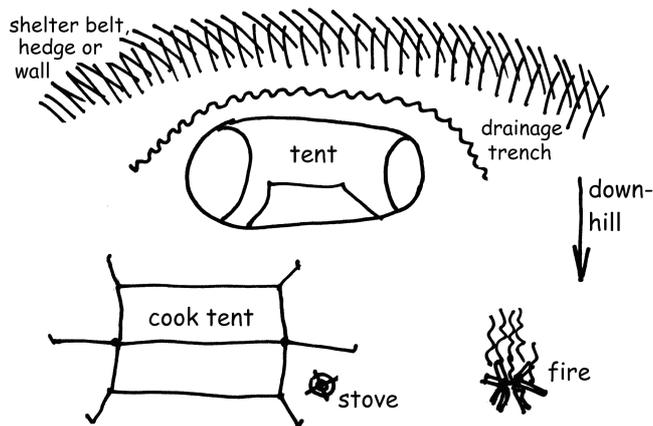
To make a cook tent all you need is a plastic water proof sheet, but ideally get a cheap plastic tarp. because the eye-holes will prevent the sheet tearing so easily in the wind. You can put together a cook tent with a good lightweight plastic/nylon tarp. and some aluminium poles for less than a kilo of added weight. An 8' x 12' tarp. will make a good cook tent for one (especially if rigged alongside your main tent) but for more than one or two people you need something bigger. You can buy poles from most camping shops, and army surplus and DIY stores sell tarps. – but army surplus shops tend to sell camouflaged ones which are much better when you're discreetly wild camping.

Laying out a camp

Extending the 'functionality' idea a little further, when we camp we also organise the layout in a certain way. The layout of the camp is designed to enhance how each element functions under whatever weather conditions. If you get used to rigging the camp in a certain way it becomes second nature and you can often do it in the gloom of dusk just as well as you can in full daylight.

Whether you pitch the cook tent or the sleeping tent first doesn't really matter, but to save time towards the end of the day it's a good idea to pitch the cook tent first so that your dinner can cook whilst you're putting up the sleeping tent.

When we pitch camp we put the sleeping tent as near as possible to some form of shelter, such as a hedge, wall or woodland – although not a rock face in case you get squashed in the night! By sheltering the tent we reduce the wind-chill effect and this stops you getting so cold at night.



If it looks like it's going to be very wet it's also a good idea to excavate a shallow trench around the uphill side of the tent (even if it's only a gentle slope) because surface water seeping underneath the ground sheet will cool you more quickly. Also be aware of any hollows or depressions in the ground where you camp and don't pitch the sleeping/cook tent in them – in heavy rain these areas can quickly become waterlogged ponds and watercourses.

It doesn't really matter which way around you rig the sleeping tent because it should be equally waterproof from all directions, but it's usually a good idea to put the door against the shelter belt to stop the weather blowing in when you open the door. The cook tent should be rigged to provide the shelter from the worst of the weather at that time – if the direction of the weather changes the next day then you just move or modify the shape of the cook tent.

If you want a fire you have to exercise a little caution. Sparks from the fire, even though they might not set the sleeping tent on fire, will burn nice neat pin holes in the fly sheet which will create a very annoying drip of water when you least want it. For this reason you should set the fire as far from your sleeping tent as possible, but conveniently near the cook tent if you're using the fire for cooking/heating water (it's better to walk to the cook tent than get holes in the sleeping tent). 'Fires' are dealt with in detail in unit 3, *Heat and Fire*.

Your cooking stove can be set up next to the cook tent, and if you have enough head space to stop the plastic sheet getting hot you could set it up inside the tent. Cooking is dealt with in detail in unit 5, *Food*.

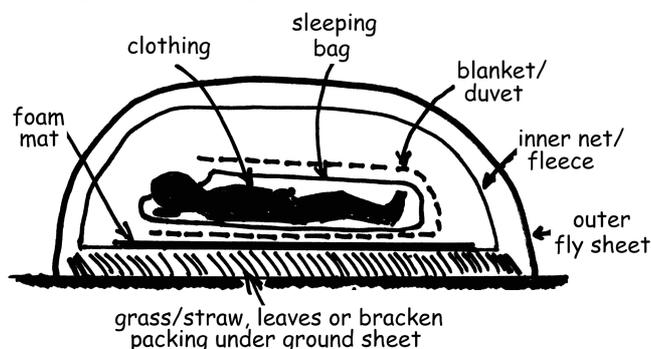
The cook tent is also the best place to locate your water and food stores, and if you have a renewable energy system you can keep it dry inside the cook tent. You don't really want to store this stuff in the sleeping tent as it takes up space, and spilling water, or even worse cooking oil or milk, in your sleeping space makes an annoying mess (hence why we keep these functions separate as this is bound to happen!). When storing food in the cook tent it's a good idea to carry a mosquito net and string it up to keep the flies and mini-beasts off – and keep the food in containers to keep the bigger beasts off too!

It's also important to get a pattern of activity for 'striking' (taking down the) camp. You're less likely to forget things, but more importantly (especially in the wet you put things back in your rucksack/panniers in

the right order. The things that you need during the day or when pitching camp – the cook tent, the stove and food – should be on top of the bag and so must go in last. Your bedding, torches and other things related to the sleeping tent should be somewhere in the middle. Your clothing and personal items should be in the least accessible bit of your baggage and so should go in first – *if you bother to take them out at all*. Ideally your baggage should be fully waterproof so it's a good idea to leave stuff inside which does not have to come out.

Bedding and insulating layers

The function of a tent is not to keep you warm. The function of a tent is to keep you dry and out of the wind. To keep warm we wear clothes and sleep in bedding that provides a sufficient level of insulation to keep warm utilising just our own body heat. Practically there's not a lot difference between a winter tent for the UK climate and the tents that Antarctic explorers use – what differs is the quality of their clothing and bedding.



To get through cold weather we don't rely on one single layer of insulation – we build multiple layers (see diagram above). Your body loses heat at an exponentially increasing rate as the air temperature drops. For this reason we only need each layer to take a few degrees off the air temperature in order to significantly reduce the level of heat loss between our sheltered and unsheltered body. To do that we concentrate on getting each layer as well designed as possible. Starting at the inner-most layer:

It's a good idea to wear loose fitting clothes when sleeping as they trap more heat. If you become chilled just pile on the layers with more clothes – start with the clean ones, and if that's not sufficient put the dirty ones on as well!

Next, your sleeping bag should be rated to fit the climate you're sleeping in. Even in Summer many "Summertime" sleeping bags won't keep you warm – especially the ones that tend to come with cheap deals on tents. Always buy a "two season" sleeping bag for the Summer – if you overheat just unzip it from the foot end and you'll slowly lose heat and cool down again. If you intend to camp in the late Spring or early Autumn get a "three season" sleeping bag.

It's always a good idea to carry a thin single blanket, or a thin duvet (as they squash down more easily). Whatever the time of year, folded in half and laid over your foam mattress, this makes a very nice covering for the ground sheet. In exceptionally hot weather you can unzip your sleeping bag fully and

sleep on top of the cover with the sleeping bag draped over you, but if the weather is exceptionally cold you can also wrap the cover around the outside of your sleeping bag to improve its insulation value.

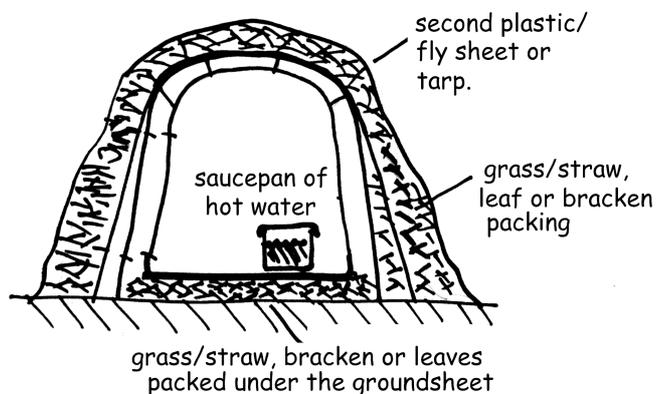
Next we have the inner wall of the tent. On cheap tents this is just netting, but on more expensive and cold-weather tents this will use a more solid layer of fabric or fleece. If you're going camping outside of the Summer months make sure that you get a tent with a fleece inner layer. Netting loses too much of your body heat and this simple difference saves a couple of degrees between the air temperature inside and the temperature under the fly sheet.

You can lose a lot of heat through the ground sheet, especially if the ground is wet or waterlogged. For this reason, even in Summer, before you pitch the inner tent insulate the ground by covering the surface with grass, straw, leaves or bracken. What you need to do is build up a layer of plant matter to create an insulating air space between the surface and the ground sheet. The colder the weather, the more you should try and build up this layer – it does make an appreciable difference to the level of body heat you'll lose from the tent.

Finally, we can minimise the level of heat loss from the tent as a whole by reducing the exposure of the outer fly sheet to the wind. In Summer we rig the fly sheet with a small air gap all around to stop overheating, but in cold/windy weather you should rig the fly sheet tight to the ground to prevent the wind getting underneath and pushing out the warm air.

Dealing with extremes

A tent is a tent. There's not a lot we can ordinarily do to it when we're out in the sticks without access to a camping shop, but if you have a spare plastic sheet or tarp. (or in seriously inclement weather, take down the cook tent and use that) we can create insulating layers over the tent to reduce the heat loss. The problem is that this involves an awful lot of work and so you need to do this *before* you get cold, not in the middle of the night when you become cold as it involves foraging for materials.



To reduce the heat loss from the outer fly sheet of the tent we need to stop the wind penetrating to its surface. To do that we need to cover the fly sheet with other materials to produce air spaces and then

cover this whole mass with an impermeable sheet to stop those layers becoming wet and losing their insulating value. It doesn't matter if they're wet already, the problem is that as rain water percolates through the material it will 'wash' the heat away. The best materials for insulating are leaves, bracken and straw. You should begin by laying small branches over the fly sheet and then pack the insulating material between the branches. The branches stop the material being compacted by the outer sheet and decreasing their insulating value, and they also stop the material sliding off the top of the fly sheet.

The door is a problem – you still need to get in and out. To solve this you build a framework of branches around the door, big enough to get through, and then pack around the edge with insulating material. Pack more material under the ground sheet too. When finished peg/weight down the edge of the cover sheet to stop the wind getting underneath, but leave it loose around the door so that you can squeeze through (if you're plastic sheet isn't big enough to cover the whole tent, just cover the windward side of the tent and leave a gap at the door). If it's really windy lay branches over the top to stop the wind whipping the sheet and tearing it.

When it gets very cold – *significantly sub-zero without wind chill kind of cold* – then body heat alone won't keep you warm. Keeping your stove running inside a tent not only presents a fire risk, but the fuel in your stove is more effective to cook hot food/drinks that warm your insides, not to warm your outside. Instead we find a means of carrying heat from outside the tent to the inside and storing it – the simplest means of doing that is using hot water and rocks.

In cold weather, when you've finished cooking, don't throw the hot water away. Keep it in a saucepan and then put the saucepan in your tent to warm it – but cover the saucepan or the water vapour will condense inside the tent and make it damp. Of course a saucepan in your tent presents a problem if you knock it over. An alternative is to boil rocks in the saucepan and then throw the water away but leave the hot rocks inside. Another option is to make a fire, heat rocks around the fire (hot enough to handle, not burningly hot!) and then wrap them in a jumper/clothing and put them inside. If you leave some rocks by the fire when you go to sleep you can get up in the night and replenish your heat source with more hot rocks, and take your cool rocks out and put them next to the re-made fire – then a few hours later you can repeat the process again.

No matter how cold it gets, your tent still offers your best chance of staying warm – what you must do to keep warm is devise ways of adding more insulation to the outside and getting heat sources inside. In the worst case pack up and move to a better location such as inside a thick hedge or woodland, or inside a barn or other building. Even a tumbledown building without a roof is better than being out in the open because you'll get shelter from the wind.