

Know your sport: Map scales and pacing

As well as understanding the symbols on the map, in orienteering there are 2 key aspects to finding controls. One is to make sure you go in the right direction, and for this you use the compass. However you also need to understand distance — you must know how far you have to go and how far you have gone. For this you need to know about map scales and pace counting.

Map Scales

People use maps for all sorts of purposes — driving, weather forecasts and hill walking are a few examples. A map of any area can be produced in a range of scales — the choice depends on the amount of detail that needs to be included, the final size of the map and the size of the symbols (i.e. can the symbols be read easily).

Orienteering maps have obviously to be produced to meet the needs of orienteers. The international guidance given in the official international specifications (see box right) tries to identify what this means in practice.

In the early days of orienteering in the UK, maps were based on the Ordnance Survey which meant that maps were often 2½" inches to one mile, roughly 1:25 000. However gradually metric scales were adopted and with increasing amount of detail being added to the maps, 1:15 000 became the accepted standard. Mappers though have continued to find areas which they feel are better mapped at other scales — often 1:10 000 or even 1:7 500. Also for small sprint areas with complex buildings, paths, steps, etc. scales of 1:4 000 or 1:5 000 are common.

There does though have to be a balance. One issue is whether orienteering involves accurate navigation using fine detail on the map or whether it is determining the best route to take over a long leg. Internationally, and for the longest courses, 1:15 000 is considered to provide the best compromise allowing the whole of a long leg to be examined for the best route but giving the required detail to navigate the route accurately.

Despite the standard for international maps being 1:15 000, here in the UK, most maps are now produced to 1:10 000 unless the area being used for the event is large when a 1:15 000 map may be used (often only for just the longer courses).

What it means:

Scale	1 cm on map =	100 m on ground =
1:15 000	150 m on ground	0.67 cms on map
1:10 000	100 m on ground	1 cms on map
1:5 000	50 m on ground	2 cms on map
1:4 000	40 m on ground	2.5 cms on map

scale 1:10,000

International Guidance

ISOM:

The scale for an orienteering map is 1:15 000. Terrain that cannot be fieldworked at a scale of 1:7 500 and legibly presented at a scale of 1:15 000, is not suitable for international foot-orienteering.

Maps at 1:10 000 may be produced for relay and short distance competitions. The scale 1:10 000 is recommended for older age groups (age classes 45 and above) where reading fine lines and small symbols may cause problems or for (age classes 16 and below) where the capacity of reading complex maps is not fully developed.

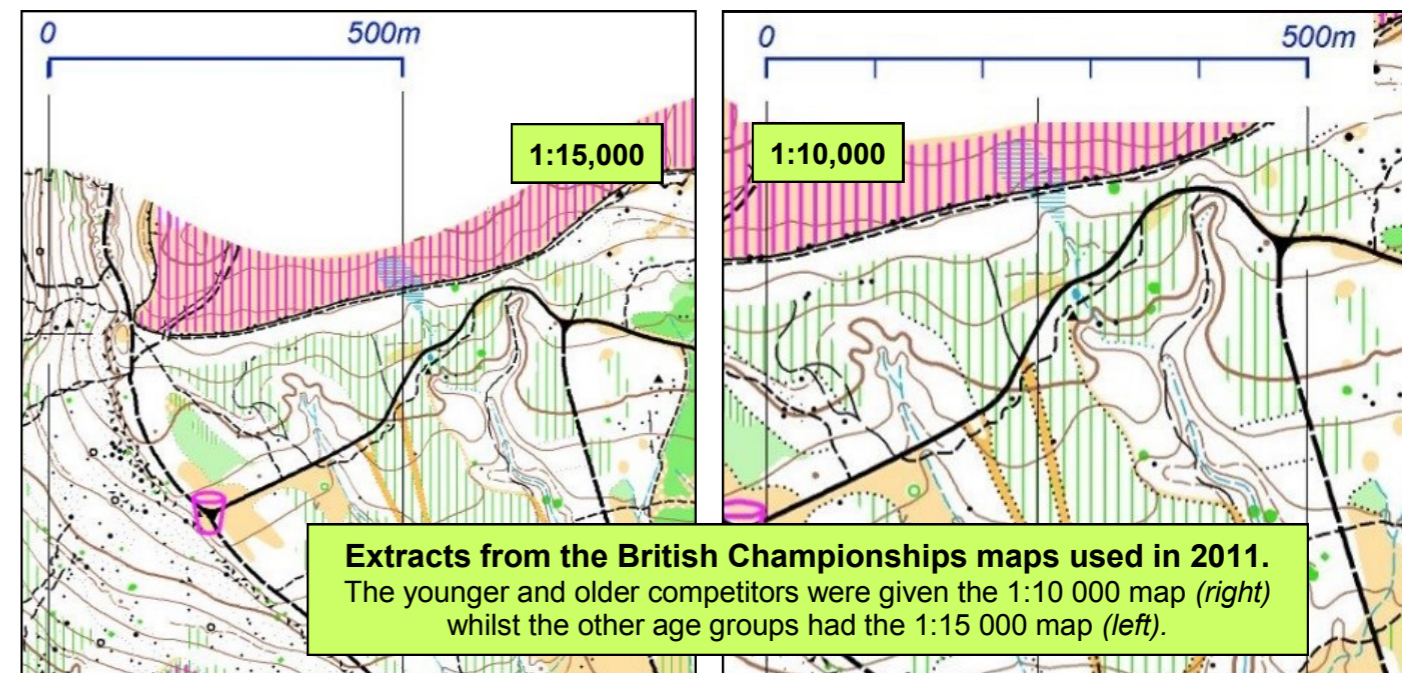
In education there is usually a progression of scales from 1:2 500 to 1:5 000 to 1:10 000. Maps at very large scales such as 1:2 500 will clearly contain additional detail such as playground equipment.

Other scales may be produced for other forms of orienteering.

For practical reasons a map should not be larger than is necessary for the orienteering competition. Maps larger than A3 should be avoided.

ISSOM (Sprint maps):

The map scale shall be either 1:4 000 or 1:5 000. The scales 1:5 000 and 1:4 000 are suitable for the sprint format. They allow course lengths up to 4.0 km with a handy map format. A scale of 1:5 000 is suitable for most terrains. However, the level of detail in some urban terrains, particularly in the centre of old towns with lots of essential features (e.g. stairs, narrow alleys or small passages) may be better suited to a scale of 1:4 000. The size of the symbols is the same for both scales.



Pace Counting

So you have arrived at your 'attack point' and now need to head off on a compass bearing into a block of featureless woodland. The problem is that the control, perhaps a 'pit', may be about 200 metres away and visibility may not be that good — so you need to have a good idea how far into the wood you have gone. The technique which everyone can use (and it costs you nothing!) is **pace counting**.

Pace counting does what it says — you count the number of times your foot hits the ground to work out your pace. But beware, you only count one foot! Make sure you choose a foot (e.g. if you are right-handed, you may find it easier to count the number of times your right foot hits the ground). Every time that foot hits the ground is a 'pace'.

If you know approximately how many paces you take to run 100 metres then, depending upon the scale of the map, it is quite easy to convert 1cm on the map into a number of paces. Whilst everyone will be slightly different, a typical count might be 40 paces per 100 metres. So a control 200 metres into the wood should be about 80 paces away. Everyone should do a test run over a measured distance—use a map of an area and run between two obvious features to calculate your own number of paces per 100 metres.

You do need though use the technique intelligently. Whilst you might manage 40 paces/100m on a good track, once you enter the wood, things will change depending upon the terrain — usually you will need additional paces either because the ground is softer or because you have to run around obstacles. So you need to add some additional paces to take these factors into account — 40 paces may become 50 (it almost certainly will need extra paces!). At the next Saturday event, club training evening or when you go for a jog, try pace counting over measured distances and over different terrains. This will help you to calibrate your own pace counting and to get a feel on how much you should adjust your pacing for different terrains.

Get into the habit of counting paces as much as possible. Even when running down a track to a junction where you will need to turn off, it is good to pace count as it will help you anticipate when the path junction will appear and there is less chance of running past it if it is not as obvious as it appeared to be from the map. It will also mean that you don't forget to pace count when you most need it.

Some of us are instinctively better at distance judgement than others — these differences are probably related to how individuals process information differently. Pace counting is a very useful tool for distance judgement. Many elite orienteers use pace counting throughout their races as one of their key navigational tools.

Some people will add a 'pacing scale' onto an edge of their compass so they can measure directly into 'paces' without going via 'metres'. But don't forget that you will need to change it if the scale of the map changes.

