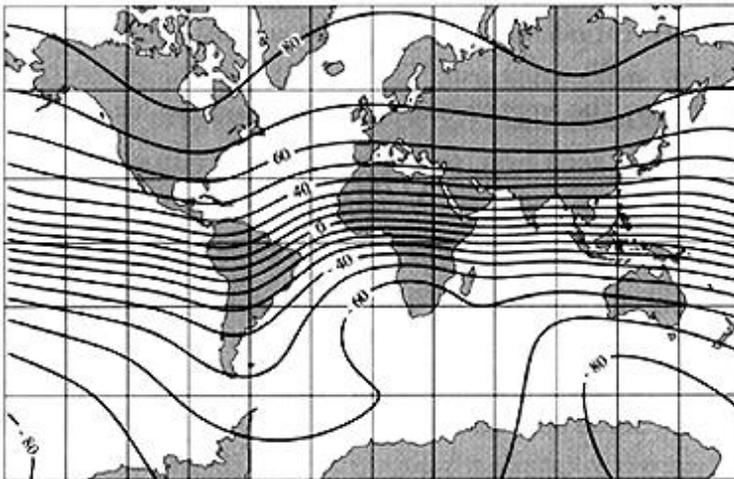
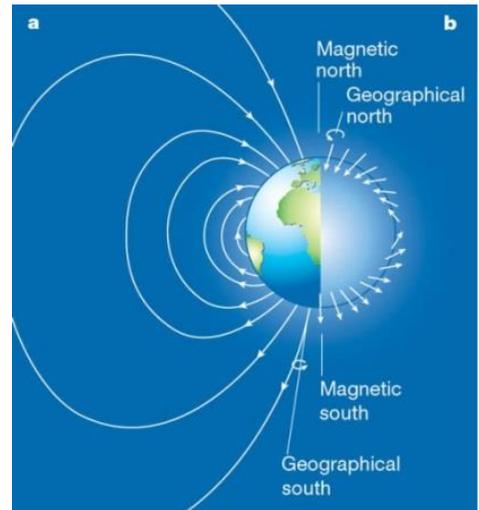


Compasses around the World

Did you know that you need a different compass if you travel to Australia or New Zealand or South America for orienteering? Ever wondered why? Read on!

When we orienteer, we use maps that are set to magnetic north, rather than geographic north. This means that we avoid needing to worry about magnetic declination, or how far away the Magnetic North Pole is from Geographic North Pole. Across the country and around the world the map layout is adjusted by the map maker to account for the local magnetic declination. And so, as orienteers, we promptly forget about declination and go on our merry way, worrying instead about route choices and relocating and staying in contact with the map.

But there is another feature of the magnetic field around our Earth that is called magnetic inclination. Magnetic field lines are not parallel to the surface of the Earth. In fact if we look at the diagram we see that near the North Magnetic Pole the magnetic field point directly into the Earth and at the South Magnetic Pole the magnetic fields points directly out of the Earth. A compass needle aligns itself with the magnetic field lines. This means that far north and far south, a compass needle wants to point directly into the ground (in the north) or directly into the sky (in the south). At what is called the Magnetic Equator, the magnetic field is parallel to the Earth's surface and the compass needle sits nicely balanced. But as one travels north or south of the Magnetic Equator, the compass needle wants to dip towards the ground or towards the sky, the angle of dip depending on the latitude. This causes the compass needle, either north or south end, to touch the base of the compass housing if the magnetic inclination is enough. This makes the compass reading inaccurate and isn't good for orienteering!



And so, compass manufacturers balance compass needles in their housing to allow for the “local” magnetic inclination. There is a map that shows magnetic inclination around the world. There is another map that uses these “contour” or isoclinic lines to divide the world into 5 sections, such that with 5 different compasses we have good coverage of the entire land mass of the world.

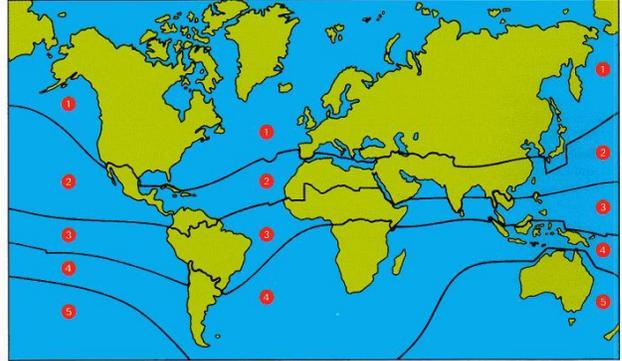
The 5 zones are: Zone 1, MN (Magnetic North); Zone 2, NME (North Magnetic Equator); Zone 3, ME (Magnetic Equator); Zone 4, SME (South Magnetic Equator); and Zone 5, MS (Magnetic South).

Compasses are built with a balance for one of the 5 zones, although some manufacturers combine them

into 3 zones, and there are now global compasses available that claim to work in all zones – but that's for another article, and anyway, we don't know of a global thumb compass.

In North America and Europe we use Zone 1 compasses. But in Australia and New Zealand, we need to use a Zone 5 compass, and in Brazil, home of the 2014 World Masters Championships we will need to use a Zone 3 compass.

So if you are planning an orienteering trip, consult the map, contact us and we'll try to help you acquire the right compass!



References:

Top diagram: http://www.nature.com/nature/journal/v421/n6918/fig_tab/421027a_F1.html

Middle diagram: http://www.fas.org/irp/imint/docs/rst/Intro/Part2_1a.html

Bottom diagram: <http://www.mapworld.co.nz/global.html>