Achmelvich

Information Sheet

Location: ACHMELVICH
Conservation designations: National Scenic Area
Grid reference: NC058248
Address: Recharn, by Lochinver, IV27 4JB
Parking available: Yes, free parking at ranger hut
Personnel to be contacted prior to visit: Open access

Useful equipment:
- Camera
- Hand lens
- Pencils
- Rubbers

Relevance national curriculum:
Earth Resources units of Environmental Science at Nat 3, 4,5 & higher
Rocks and Minerals units of geology at Int 1 (Nat 4), Int 2 (Nat 5) and higher
National Curriculum Es and Os such as SCN 2-17a and SCN 3-17b

Rock types and geological processes observed: Gneiss and dolerite. Folding, regional metamorphism, crust tensioning and dyke intrusion
Geological structures: Anticline, dykes, shear zone
Earth processes: eg. Continental crust formation, metamorphism, magma intrusion, coastal erosion
Geological periods present: Precambrian (Archaean and Palaeoproterozoic)

Site specific hazards and risks:
- Inclement weather (leading to hypothermia, sunburn etc.) and or people being ill prepared for walk (leading to hypothermia, sprained ankles, lack of fitness for route etc.)
- Falling off slope or into water
- Tripping and slipping
- Trampling or kicks from livestock
- Ticks (Lymes disease)
- Anaphylactic shock from insect or sea creature bites and stings.

Mitigation measures:
- Review weather forecast & cancel if necessary.
- Bring weather protection (sunscreen, hat, waterproofs). Circulate kit list in advance and check kit before leaving.
- Take first aid kit and emergency communication. First aider present.
- Stay together and on paths where possible, warn of dangerous sections.
- Keep away from cliff edges and livestock. Set out boundaries.
- Issue tick warning and advice. Include tick remover in first aid kit.
- Take insect repellent, avoid touching rock pools and stranded jelly fish etc.

Did you know: The rocks at Achmelvich are around 3 billion years old and our planet is thought to be 4.5 billion years old. If you stretch your arms out to the sides and look at the tips of your finger nails on one hand, the white edge of your finger nails represents the amount of time that humans have been on the planet, the rest of your body across to your other fingertips represents the rest of time! So, the Achmelvich rocks were formed around about your elbow.
The Lewisian gneiss found here and in Geopark Shetland are the oldest rocks found in the Drifting Apart area.

Topics to cover before visit: Metamorphic and igneous rock, structure and formation. Continental crust formation and regional metamorphism.

Keywords: Gneiss, dolerite, dyke, intrusion, folding, boudinage, jointing, Pre Cambrain.

Format developed by the Western Education and Library Board's Magilligan Field Centre

Site 1: Classic example of gneiss as seen immediately upon entry to beach. (Exhibiting joints, bands, boudins and onion skin weathering). Joints are the cracks which split the gneiss – they can occur in any.

Site 2: Scourie dykes in the Lewisan gneiss

Site 2: Scourie Dykes showing xenolith of gneiss which was picked up and carried when the dolerite was molten. The boundary between the dyke and the gneiss is straight and sharp.

Site 3: The joint between the gneiss and the dolerite creates a plane of weakness and so the sea has cut a deep inlet.

Site 4: Folded gneiss (bands form under vertical pressure, then a sideways force folds the bands)

Site 5: Big "eyes" of dark pyroxene rich gneiss in quartz rich gneiss "boudinage".

Geological history*:

The rocks at Achmelvich are called Lewisian gneiss (pronounced 'nice') and are a type of metamorphic rock. Lewisian gneiss is up to 3 billion years old and is found in the North-West Highlands Geopark and in Geopark Shetland but is named after the Isle of Lewis which is made up almost entirely of this rock type. They are very distinctive, stripy rocks and tell a story of squeezing and stretching in hot conditions deep underground. They originally started out as igneous rocks and studying the minerals which make them up helps us learn about their journey. They contain lighter minerals (quartz and feldspar) and darker minerals (amphibole and pyroxene).

The history of the gneiss is very complex and only a broad picture can be given here. Here the original igneous rocks were metamorphosed at extremely high pressures and temperatures, equivalent to depths in excess of 20 km, about 3 billion years ago. This gneiss then underwent stretching which allowed basic magmas to intrude to form the Scourie Dykes. The intrusive igneous relationships are visible at site 2. Later movements caused some slight shearing and re-metamorphism at the edges of the dykes.