Gortmaconnell

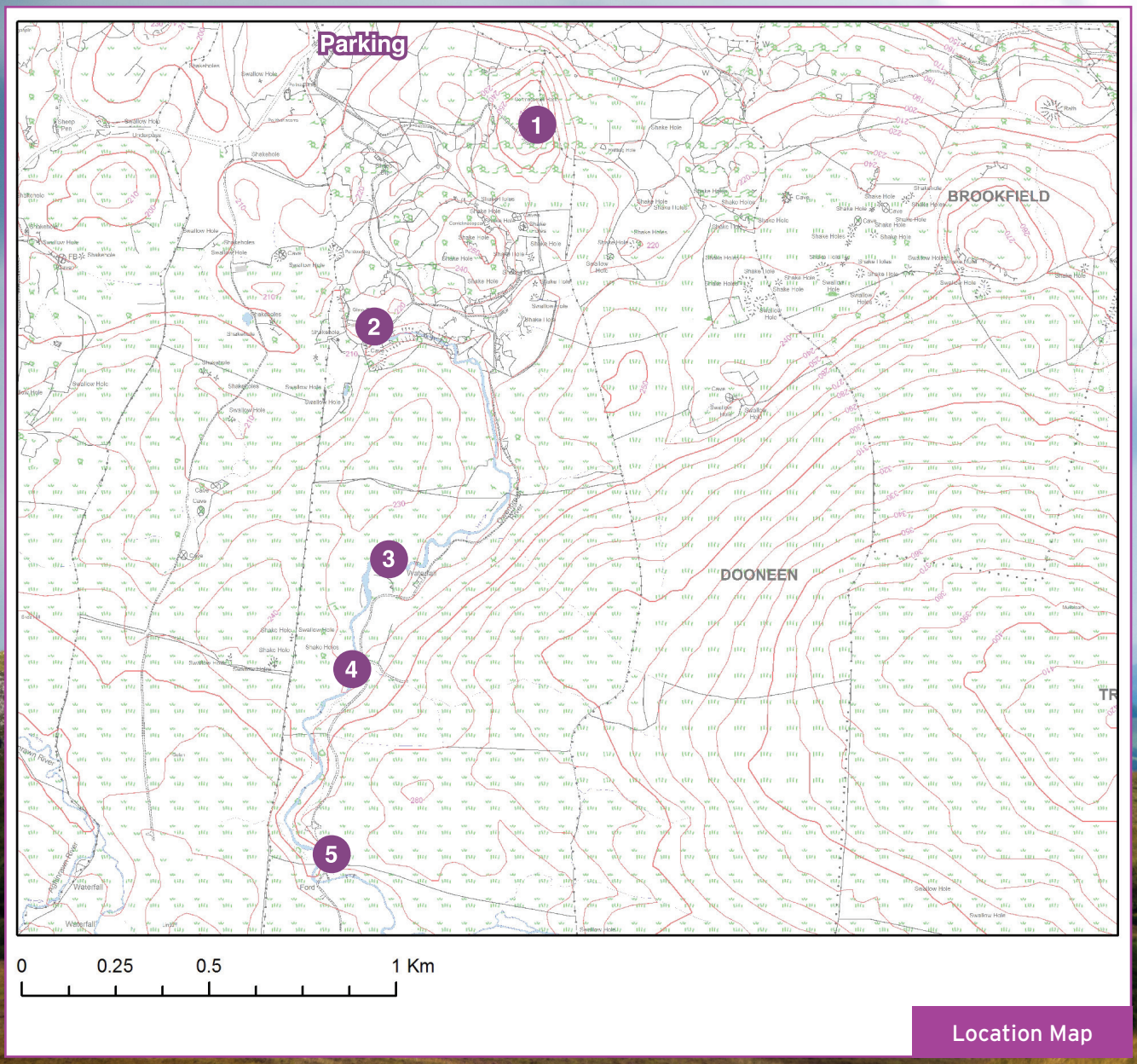
Teacher's Sheet



Visit Time: 3 to 4 hours

Following a well-maintained farm track on the northern slopes of Cuilcagh Mountain, the visit to Gortmaconnell follows a near complete succession of Lower to Upper Carboniferous sedimentary rocks. This is ideal to follow on after the Cladagh Glen to allow for a complete succession to be experienced.

All sites are easily accessible on foot from a well-maintained farm track.



Location Map

Teacher's Notes

SUGGESTED STOPS	POINTS TO NOTE
Access:	Parking is available at the entrance to Gortmaconnell Rock Viewpoint (clearly marked) at the start of the track. This is located just off the Marlbank Road, roughly 1 mile from the Marble Arch Caves.
1	The track at Gortmaconnell follows the course of the Owenbrean River, one of the three rivers draining the north slopes of Cuilcagh Mountain. Approximately 200m after you enter the gate at the start of the track, there is a fork in the track. Take the left hand fork and travel uphill until you reach the top of Gortmaconnell Rock. Gortmaconnell Rock provides fine views to the north and across the Marlbank karst towards the Burren Forest in the west as well as to the Cuilcagh ridge to the south. From Gortmaconnell Rock, Lough MacNean can also be seen. Lough MacNean is divided into Upper and Lower Lough MacNean separated by a deposit of sand and gravel that lies between the towns of Belcoo and Blacklion. The valley that Lough MacNean now occupies was carved by a series of glaciers during the Pleistocene, each removing evidence of its predecessor. As the ice sheets melted, global sea level rose and the resulting rise in sea level caused the flooding of major valleys such as Lough MacNean. The sand and gravel deposits are a result of glacial debris (or moraine) that was left behind when the glacier melted.
2	Return on the path you came on until you reach the fork in the track. Take the right hand track and continue south. There are exposures of the Dartry Limestone Formation on either side of the track, some of which display lenses and beds of a dark grey / black rock called chert – a siliceous rock of sedimentary origin thought to originate from sponges. The limestone exposures are often covered in vegetation and thick willow and hazel scrub has developed in many places, a common vegetation assemblage in limestone landscapes.
3	As you continue onwards you will become aware of a river on your right hand side, this is the Owenbrean River. Depending on what time of year you visit this riverbed may be dry. Because the riverbed is overlying limestone, in low flow (mainly during the summer) the river sinks below ground further upstream, leaving the riverbed completely exposed. The river course takes a sharp deviation about 1km along this path. This is an indication of the presence of the Cuilcagh Fault and the subsequent Cuilcagh Dyke. The Cuilcagh Fault is a northwest-southeast trending fault (a fracture in the rock along which there has been movement) that can be traced all the way across Cuilcagh Mountain. The Cuilcagh Dyke is a vertical sheet of igneous rock that was injected or intruded along into the line of the Cuilcagh Fault. The Cuilcagh Dyke formed at around the same time as the Giant's Causeway, when large Earth movements associated with the opening of the Atlantic Ocean produced large amounts of molten rock beneath the surface. In some cases, like the Giant's Causeway, molten rock flowed as lava above ground from volcanoes, but in other cases the molten rock stayed beneath the ground where it cooled and hardened to form vertical sheets of rock, or dykes. The Cuilcagh Dyke has greatly influenced the hydrology of the region, both below and above ground. The courses of the 3 rivers on the northern slopes of Cuilcagh Mountain all take sharp deviations when they cross the Cuilcagh Dyke, reflecting the variation in rock types between the hard resistant dolerite (igneous) and softer limestone (sedimentary). Just before the sharp deviation of the river (H132 325), there is an exposure of thinly bedded limestone. This is an exposure of the top of the Dartry Limestone Formation, where the beds become much thinner as the sea level at the time of deposition became much shallower. This limestone exposure displays localised folding that is probably associated with the Cuilcagh Fault. If water levels are low, it is possible to see the Cuilcagh Dyke exposed in the river bank. It displays characteristic spheroidal weathering, typical of many igneous rocks and has weathered to a rusty red brown colour. This is due to the high amounts of iron found within this quartz-rich dolerite. **Please note:** This is an active river system and the dangers associated with it should be taken into consideration before visiting this site. **Do not** attempt to visit the Cuilcagh Dyke in high water flow. The limestone that is directly in contact with the dyke displays contact metamorphism where the heat produced from the intrusion of this molten rock has altered the limestone to a form of 'marble'. This is particularly noticeable as the limestone contains colonial corals that have been thermally altered and become crystalline.

4	Some of the rocks in the riverbed contain cavities known as gypsum pseudomorphs as at one time they would have been infilled with gypsum that has since disappeared. Gypsum is an evaporitic mineral and formed from the evaporation of a surficial body of water. For this to happen the water body must enter a restricted environment where water input remains below the net rate of evaporation. This is usually an arid environment with a small basin fed by a limited input of water. These rocks come from the Meenymore Formation which lies stratigraphically directly above the Dartry Limestone Formation. The Meenymore Formation consists of interbedded grey, brown and green shales and mudstones, pale grey siltstones, laminated algal limestone, muddy limestones and calcareous sandstone. The presence of evaporite minerals and algal limestone would indicate a tidal flat environment similar to that now found in the Persian Gulf and is further evidence of the decreasing sea levels and the gradual change from a shallow-marine to a terrestrial environment.
5	Continue on up the track and if the river is in low water flow you may now be able to see (or at least hear) the flow of the water. The rock types change as you move up the track, from limestone to sandstone. Water cannot sink beneath the sandstone so it flows over the surface, indicating that the rock type has changed even if the rock itself is not exposed. At the end of the track is a small exposure of pale yellow / orange fine- to medium- grained sandstones displaying ripple laminations just beneath the track to the right. These can be clearly seen as the sandstone is friable and many blocks have fallen off exposing excellent rippled surfaces. These would have formed in a tidal flat environment as a result of wave action. This can be assumed rather than fluvial action as the ripples are symmetrical indicating the two-way flow of water associated with waves.