1. BRIEF DESCRIPTION

In south Devon you can find a rock type called Lower Devonian schist. This rock name can be broken down to ‘Lower Devonian’, which refers to the geological time period in which the rock was formed, and ‘schist’ which is a type of rock. This type of rock is believed to be the oldest in Devon and they are quite distinct from other rocks elsewhere in the county.

A schist is characterised by thin parallel bands of minerals and was formed in a process known as metamorphism. The word metamorphism comes from the Greek ‘Meta’ meaning change and ‘Morph’ meaning form, so it means to change form. In geology this refers to the changes in mineral assemblage and texture when a rock experiences pressures and temperatures different to the conditions under which the rock was originally formed.

The schist rocks are found only in the southernmost tip of Devon, around Salcombe and the surrounding area in the South Hams district, with outcrops along the spectacular coast between Start Point (in the east) and Bolt Tail (in the west).
The colour and mineral content of the schists are controlled by the original rock type before the process of metamorphism. The age of the schists is not certain because no fossils have survived but they are most likely to be altered Lower Devonian rocks over 400 million years old.

Two types of schist rock are found; green hornblende schists dominated by a mineral called hornblende, and grey mica schists largely formed of a shiny flaky mineral called mica.

The schists were formed and brought to their present position by mountain building processes involving the collision of two continents, this process is known as ‘plate tectonics’. The schists have a faulted contact with younger Devonian rocks to the north. A fault is a fracture in rock in which the rock on one side of the fracture has moved with respect to the rock on the other side. The rocks also feature folds which form a broad arch structure (called an antiform) several kilometres wide, with smaller folds which can be seen in individual outcrops. These characteristics are common in rocks which have been affected by plate tectonic movements.

The distinct green colour and shiny mica rock surfaces, together with the folding, make the schists an attractive and unique rock in the geology of Devon.

2. GEOLOGICAL DETAIL

The schist rocks in south Devon form what is known as the Start Point Complex comprising two main rock groups: green hornblende schist and grey mica schist. Schists are generally named according to their most prominent mineral.

Green hornblende schists consist of the minerals hornblende-chlorite-epidote-albite and minor sphene and other amphiboles. The amount of chlorite and hornblende present within the schist depends on the degree of dynamic metamorphism (intense local stress), the greater the metamorphism the increased percentage of hornblende.

Grey mica schists consist of the minerals muscovite mica-quartz-chlorite-albite with a raft of accessory minor minerals including sphene, tourmaline and rutile. Quartz commonly forms bands or veinlets between the mica and chlorite. The mica schists have a well developed schistose fabric (mineral banded foliation) compared to the hornblende schists which are sometimes more massive.

The hornblende schists are formed from original basic lavas, sills and tuffs, and the mica schists are the result of metamorphism of slates or shales, siltstones and sandstones. The mica and hornblende schists are interbanded indicating a close time relationship between the original igneous material and sediments.

The schists are folded on a large scale to an antiformal structure with an east-west trending axis which dips west. Local minor folding is also seen.

The age of the original igneous and sedimentary rocks altered to form the schists has been difficult to identify, because no fossils have survived the metamorphism, but the original rocks are likely to be of Lower Devonian age – over 400 million years ago. The geological structure within the rocks indicates a single major phase of deformation and the east-west trending structure is parallel to the adjoining Devonian slates to the north. Alternatively, much older original rocks have been suggested from Lower Palaeozoic or Pre-Cambrian ages which may date back as far as 500 or 600 million years ago.
3. USES

Schist is relatively hard and it cuts easily into elongate shapes, so it has been used as a local building stone in walls, Devon hedge banks and some buildings in the southern area of the South Hams.

4. PLACES TO VISIT

Please refer to the safety guidance about visiting geological sites on our website before visiting the places listed below.

The Educational Register of Geological Sites in Devon provides three excellent examples where the schist rocks from the Start Point Complex can be viewed. (www.devon.gov.uk/educational_register.htm)

**North Sands Bay**

On the south side of Salcombe (National Grid Reference SX 731 381) provides exposure of the schists and local scale folding. The site is a County Geological Site (www.devonrigs.org.uk) and is readily accessible with safe viewing from North Sands beach on a falling tide.

**The Shippen at Outer Hope**

Provides the only good exposure of the Start Boundary Fault contact between the schists and Middle Devonian slate with a mylonite fault zone (National Grid Reference SX 675 401). The site is a County Geological Site (www.devonrigs.org.uk).

**Prawle Point and Start Point**

The South West Coastal Footpath connects Prawle Point and Start Point (National Grid Reference SX 741 373 – SX 819 381) providing exposure of green and grey schist along the route.
(www.southwestcoastpath.com/main/discover/Geology_P2.cfm)

**Bolberry Down**

The Coastal Footpath can also be readily accessed at Bolberry Down between Salcombe and Hope Cove where there is parking at SX 689 385 with easy access to the cliff tops and extensive exposures of the mica schist and some magnificent coastal views.
5. PHOTOGRAPHS

Start Point, at the southern tip of Devon, a rugged coast formed in mica schist rocks with steep schistose fabric dip to the south. © DPRoche

Grey mica schist forming a sharp ridge with saw-tooth profile down to Start Point lighthouse. © DPRoche

Folded green hornblende schist on the south side of North Sands, Salcombe. © DPRoche

Grey mica schist with well developed schistose fabric and much knotted quartz. © DPRoche

Green hornblende schist in a cut rock face (above) and used as building stone in Salcombe (below). © DPRoche