

Explain how folding influences the development of landforms:

The process of **folding** has influenced the development of landforms throughout the globe. Folding of rocks occurs when they are compressed from plate movement due to the collision of the earth's tectonic plates. As a result of this collision, the rocks are buckled upwards in a process known as *orogeny*. Orogenic forces can therefore be defined as '*fold mountain building*' processes.

In Ireland, 450 million years ago a collision between the American and Eurasian plates caused Ireland's oldest fold mountains to form – those of the North west such as the Twelve Pins. This period is known as the Caledonian Period. Here the ocean floor (oceanic crust) in between the plates was subducted under both continents (continental crust) and as the sea bed disappeared the seafloor sediments were buckled up to form the sedimentary rocks of the Caledonian fold mountains. The Grampian mountains of Scotland and the Appalachians in North America were also once part of this huge mountain range that stretched across Pangea diagonally. This collision also caused large parts of the area of Leinster to buckle and led to the formation the Dublin and Wicklow mountains in the east of Ireland, including the Leinster Batholith.

The subducted ocean floor melted under the mountains and then rose up through the buckled rock layers to form plumes of magma which cooled slowly in the upfolds of the Dublin and Wicklow mountains to form batholiths of an igneous rock called granite. Granite has large crystals of mica, feldspar and quartz. The heat from the magma in the batholiths changed (metamorphosed) the sandstone which surrounded the cooling magma into quartzite. Since then both the granite and the quartzite rocks have been exposed to form very different landforms eg. The Sugar Loaf. The quartzite (metamorphic rock) forms quartzite landscapes with very pointed sugarloaf peaks due to frost action.

Folding also impacted the landscape in the south of Ireland with the 'Munster-Ridge Valley' province. About 350 million years ago old red sandstone was formed as Ireland was travelling across the equator and had a desert climate (as part of Pangea). It was later covered with limestone rock as the region was covered in a warm shallow sea. Then during the Armorican period, 250 million years ago, these rocks were buckled during a collision between the Eurasian and African plates. The compression came from the south so the folds run across the bottom of Ireland and have an east-west trend. This can also be noted as the rivers that flow through this region flow from west to east, following the downfolds of the mountains. The limestone was easily eroded from the fold anticlines (peaks) and they are seen today as sandstone mountain ridges such as the MacGillycuddy Reeks. Limestone is preserved in the fold synclines (downfolds), eg. the Blackwater Valley, which is an extremely fertile agricultural region today as a result.