



## **Building The Bigger Picture - Using a field study geology programme to link and contextualise classroom topics.**

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Cornwall, UK, has been designated a World Heritage Site for industrial heritage, based on the extensive mining history built around hydrothermal deposits of tin and copper suite deposits.

These deposits are found in a very varied and complex geological setting. The tectonic activity which emplaced the deposits also produced intense folding and faulting of Carboniferous and Devonian marine sediments, major and minor igneous intrusions, regional and contact metamorphism, and the emplacement of an ophiolite sequence on the Lizard peninsula.

The region is targeted by college and university geology student groups from across the UK. It is also the home of the world famous Camborne School of Mines, part of the University of Exeter.

We have developed a comprehensive series of field visits to cover all these geological aspects. We also use the history of mining as a context within which to teach the social, environmental and economic aspects of the geology curriculum at A Level. By this means we can reveal how disparate geological topics link together through 3 physical dimensions plus time.

Field visits motivate students; they enthuse and excite them and help them to understand the large-scale and 3D visualisation aspects of geology, the timescales involved, and also assist students in developing observational and practical field and mapping skills. The series of visits also helps to bring many aspects of the curriculum together into a more complete picture.

Site 1 – Bude. Intense folding of marine sediments with tectonic and sedimentary structures in cyclical sands and shales and some turbidites. Competent and incompetent rocks, axial planar cleavage, etc.

Site 2 – Praa Sands. Minor porphyritic intrusion with baked & chilled margins and flow aligned feldspars. (Also incidental raised beach due to post-glacial isostatic rebound.)

Site 3 – Rinsey Cove. Contact zone where ‘roof’ of major granitic intrusion intrudes slates. Pegmatites, classic marginal features, xenoliths, stoping and faulting visible.

Site 4 – Polurrian Cove. Western end of boundary thrust fault between metamorphosed subterranean lava flows (hornblende schists) above and crustal Devonian slates below can be observed.

Site 5 – Coverack Cove to Godrevy Cove. The beach rocks change from olivine rich serpentinitised peridotite to gabbro as you move across the Moho boundary zone. Further along the coast at Dean Point, dolerite dykes are quarried and basalt dykes are found at neighbouring Godrevy Cove – the complete ophiolite sequence in a few miles!

Site 6 – Holmans Mine. Camborne School of Mines’ training mine where students can experience blasting and see methods of rock stabilisation. They can also see mineral veins in situ underground and investigate mining techniques.

Site 7 – Carnon Valley. Once known as the ‘richest square mile in the World’ due to the amount of tin and copper being produced. The Wheal Jane pollution incident (1992) caused widespread alarm and was dealt with by chemical and biological treatment systems still in operation. Historical and current tailings dams can be seen

and compared, and the ecology of environmentally damaged ground observed. Mine dumps still yield mineral specimens and the streams are still acidic after heavy rain.