

Topic: Rock sequence interpretation – Which came first?

The purpose of this information handling activity is to reinforce the key principle used to interpret sequences of rock strata. It is the straightforward concept that, in any sequence of sedimentary rocks, the oldest beds should be at the bottom of the sequence and the youngest at the top.

This is always the case unless something strange has happened – like you find at Knockan Crag. It would be undesirable to reveal to pupils the conundrum at Knockan in advance of their visit, but you should be warned that the sequence of strata there does not appear to obey the 'Law of Superposition', as the above principle is known. The topmost rock in the sequence at Knockan is an ancient metamorphic rock, which simply should not be sitting on top of an otherwise normal sequence of younger strata.

In fact, the metamorphic rock is NOT part of the local sequence of strata even though it gives every appearance of being so. It has arrived at its present position after being pushed a long way westwards over the top of the younger rocks. Knockan Crag is an important site in the development of geology as a science because it was the first place in the world where this kind of relationship was clearly demonstrated. The realisation that such a thing was possible was an important breakthrough in leading to our present-day understanding of how continents 'drift' about the surface of our planet and create so many major topographic and geological features.

For pupils to understand what they are going to see at Knockan Crag, it is important that they fully grasp the principle underlying the 'Law of Superposition'. Since it is so intuitive and obvious, the suggested activity *Which Came First?* (**see Rock sequence interpretation – worksheet.pdf**) should not take too long to complete.

Depending on the pupils' previous experience, you may wish to reinforce the distinction between plan and section drawings. Analogies with layered cakes or plasticene models might be appropriate!

The terms limestone and conglomerate are used in the diagram and may need further explanation or research. Limestones are sedimentary rocks that are made up of carbonate minerals such as calcite. The carbonate often comes from fossilised marine organisms. Many limestones are therefore indicators of ancient marine life, even though recognisable fossils may be absent or visible only under a high powered microscope.

Conglomerates (also known as pudding-stones!) are formed from coarse sediment full of pebbles and even boulders. They are associated with fast-flowing rivers and beaches exposed to strong wave action.