

NATIONAL STONE CENTRE: KS2 KEY OBSERVATIONS AND INTERPRETATIONS

The table below summarises the main teaching points related to key observations and interpretations on the formation of Rocks, Minerals and Soils at the National Stone Centre.

Remember that you are walking around large holes dug into an ancient tropical reef.

Observation	Interpretation
The rocks are layered in beds	The layering indicates that the sediments were deposited in water. Oldest at the bottom.
The layering varies from place to place. In North East Quarry the bedding is very clear.	This is the quiet lagoon at the back of the reef.
Reef Quarry shows some bedding and South East Quarry shows bedding sloping away. [Not part of the KS2 Trail]	Waves broke off lumps of reef material which rolled down the front into deeper water.
The rocks are mostly creamy-white in colour and made of fossil shells and lime mud. They react when tested with acid.	They are limestones, formed in the sea. The fossils indicate a Lower Carboniferous age
The fossils include corals, which today live mostly in shallow warm tropical waters.	The water was likely shallow and warm [within the Tropics, near the Equator].
Some limestone is black and smells of oil/petrol.	The organic muds were buried under quiet stagnant conditions. The remains of microscopic animals have become oil. [Compare with plant material growing in swamps becoming coal]
In North East Quarry the beds slope [dip] gently eastwards and they are broken by near-vertical cracks.	Long after they were laid down in the sea, the rocks were uplifted, broken and tilted by great Earth movements. In places the rocks were severely broken and moved, forming faults.
In many parts there are cracks filled with minerals.	During Earth movements, hot watery fluids containing chemical elements rose through the crust. They cooled and precipitated minerals on the walls of cracks to form mineral veins. Minerals include galena, pyrite, calcite and quartz.
Yellowish clayey soil rests on the limestone and frequently includes limestone fragments towards the base. Thin humus layer.	Plant acids and acid rain are involved in the weathering of limestone. The clay impurities in the limestone are left behind to form soil.

The following table summarises the uses made of Rocks, Minerals and Soils.

Key Observations on the use of Rocks Minerals and Soils

The following observations and brief comments relate to the uses made of the rocks, minerals and soils in the area of the National stone Centre. Much discussion and follow-up work can be linked to wider areas of the curriculum.

Observation	Comment
The Limestone has been quarried – Large holes, vertical cliffs, signs of drilled holes for blasting. Unfortunately there are no large machines on-site, but view into nearby Dene Quarry for techniques of quarrying and large machines.	Building stone for walls [other rock types brought in to build demonstration steps and millennium wall]. Aggregates for making roads, railway ballast etc Mixed with shale and baked to make cement. Lime for agriculture, limewash on walls. Chemical industry. [Visit Display area on the Story of Stone. Follow-up research on uses of Limestone, based on PEST 38 -Limestone]
Abandoned mine chimneys, buildings and shafts show that minerals have been mined in the area	Most important was the shiny grey heavy mineral, galena. This is the chief ore of lead. Other minerals include pyrite, calcite and quartz.
Soils are yellowish, clayey and thin, with grass and some trees.	Limestone grassland is a distinct wildlife habitat, & reminder of the links between geology and wildlife at this SSSI site. Farming in the area is mostly pastoral.