

KS3 DENE QUARRY (BLACK ROCK)

TRANSFER TO THE DENE QUARRY VIEWPOINT.

☛ However, first we go north to see Dene Quarry, a working limestone quarry. Take the group back through the bridge and past the car park. Use the footpath and turn right on the footpath along the roadside to Dark Lane. Take care crossing the road.

At the end of Dark Lane cross the stile and the (often muddy) field to the Dene Quarry viewpoint. The route is marked in **figure 2** in **BR3 locaccess** This transfer should take about 20 to 30 minutes, depending on the time allocated to Pupil Worksheet 7.

DARK LANE.

During the short walks between the sites Pupil Worksheet 7 should be used to help pupils observe the effects that different rock types have on the landscape due to their physical and chemical properties, and the way they weather. The view to the East is of Black Rock Crag, the final stop of the visit.

The three rock types are limestone, shale and sandstone.

Limestone is a physically hard, low porosity rock, which weathers chemically, mainly along joint planes, its weathering products are removed in solution. Only the "impurities" are left to form the thin soils. The high permeability is due to joint planes which allows surface water to sink underground very quickly.

Shale is chemically quite resistant to weathering as it is itself a weathered product (mainly from feldspars). Any iron in the shale may oxidise giving a "rusty" set of colours. It is physically very weak, especially when wet, and is not used for building (unless fired in a kiln. When really wet it slumps and slips on steeper slopes around Black Rock. It is weathered here to form the valley slopes.

Sandstone is made of chemically and physically resistant quartz grains, but the strength of the rock depends on the mineral cement holding it together. Most sandstones have their cement weathered away releasing the grains into the soils. This sandstone is fairly strong and has been quarried for millstones.

Some significant landscape features are summarised here for Group Leaders.

At different times of the year, some or all of the following points can be observed:

Sandstone (at Black Rock): Porous and allows water to drain away. More resistant to weathering than the shales it forms the crags. It supports vegetation of heather and birch woodland; soils sandy and drier. Notice the birch colonisation in the joint planes of Black Rock itself. Quarried at Barreledge for millstones and building stone.

Shale (between the B5036 and Black Rock): vegetation grassy fields (including cotton grass) and woodland; soils heavier and damper due to low permeability, and the springs flowing from the permeable gritstone over the impermeable shale. (Often there is a small pond behind the spoil heap, on the shale) The shale is eroded to form valley as it is less resistant to weathering and erosion. Some landslipping, but not easy to see. (The walls here are mainly of sandstone).

Limestone (along Dark Lane): Note: the area on the east of the path has been disturbed by large vehicles. Ask pupils to concentrate on the west side. thin soils with small quarry scrapes showing limestone just below surface; limestone used for walls; no surface water (puddles on the compact surface of Dark Lane do not count); grassy fields for rough grazing; the slope of the land more or less follows the dip of the bedding planes to the east (i.e. it is a dip slope). The hummocky landscape to the west marks the area of lead mining on the limestone, where the mineral veins outcropped.

Group leaders with a biological interest might draw pupils attention to the Cromford Mine spoil heap, a few metres south of Black Rock

The spoil heap: little vegetation due to the presence of lead from the spoil. At certain times of the year lead resistant plants like Spring Sandwort and Alpine Pennycress can be seen.; without vegetation to bind it, rainwash is gullyng the material in the spoil heap – the start of overland flow to rivers.

KS3 DENE QUARRY (BLACK ROCK)

3. Dene Quarry Viewpoint:

(about 45 minutes)

👉 The information board at the viewpoint site is detailed, and provides most of the factual information pupils might require about the vista before them. (See **BR4 bt KS3**, page 3 for group leader summary)

Figures 1 and 2. The Dene Quarry Panorama



KS3 DENE QUARRY (BLACK ROCK)

☛ Allow pupils to view the site, drawing their attention to the information board (fixed to an interesting limestone block). This usually takes several minutes.

Explain that this is a production site, much like any factory. There are natural raw materials being quarried and processed into products needed by the construction industry. The exercise is to describe the process and understand that there is a compromise society has to make in order to have these products from a National Park area.

Larger parties can be split to do the two activities on Worksheets 7 and 8, and still be kept under supervision. The edge of the quarry is fenced

“How many reasons can you think of that would explain why this limestone quarry is here?”

[It is a suitable material for roadstone because a) it is physically strong and can take the weight of traffic, b) it is chemically quite strong (because it isn't porous the chemical weathering is confined only to the exterior of the limestone fragments) c) it bonds well to the asphalt
It is also a suitable site because of d) closeness to roads for transport e) there are lots of reserves for future years f) there is a large demand for roadstone in this part of the country (Nottingham, Derby, Birmingham, Manchester etc.)

“Using worksheet 7 make a labelled sketch of the quarry and the activity you can see”

“Using worksheet 8 and the information board, describe the development of the activities of the Dene Quarry”

☛ The final site is at Black Rock, and is about a 10 minute walk. Retrace your steps back to the B5036, carefully cross the busy B5036 and turn right then left into the Black Rock picnic area. Remind pupils to complete the second section of worksheet 6 for this area. (NOTE: The muddy field you have just crossed is not underlain by shale, it is the thin calcium rich clay soil weathered from the limestone). Proceed to the top of the picnic area and turn left along the High Peak Trail (see figure 2 in document **BR3 locaccess**) and then turn right up the steep path to Black Rock crag.