Huntley Quarry Geological Reserve

Teachers' Guide

The following information is designed to help you when accompanying pupils to this site. It is best used in conjunction with the Key Stage 3 Pupils' Worksheet and Teachers' Version of the Worksheet. There is a Huntley Quarry Geological Reserve Guide also available and an interpretation board sited close to Site 2. If you require a geologist to accompany you on part or all of your field trip, please contact Gloucestershire Geology Trust on 01452 864438 or hellen@glosgeotrust.org.uk.
[A charge may be made for this service, which will depend on the amount of time and preparation involved.]

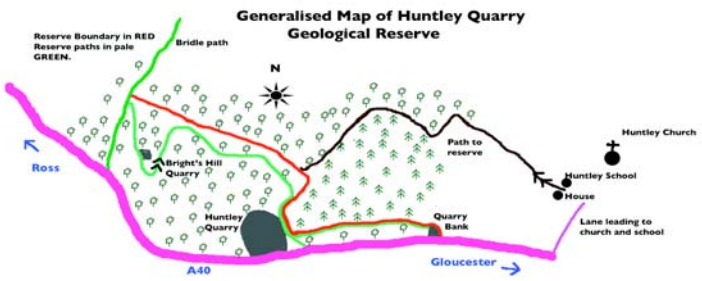
Huntley Quarry and the surrounding woodlands were bought by Gloucestershire Geology Trust in 2008 and is the first reserve of its type in the country.
It is situated about 1 km to the west of Huntley village on the A40, Gloucester to Ross on Wye road. The quarry lies about 300 metres WSW of Huntley Church (Grid Reference: SO 7100 1955).

Access:
Vehicular access is very limited at the reserve. It is recommended that visitors park in the Country Garden Centre car park. Once parked visitors can walk to the site via a path (Right of Way), which can be found on the lane leading from the church to the school. Follow the path as it passes between a house (to the left) and the school (to the right) and winds its way up the hill. After climbing some steps, a small crossing will be seen. Follow the path that passes to the left, with conifers to the left of it. The path will widen after a short distance and the reserve notice will be seen. The path continues and leads to the back of the reserve, onto the main path leading to Huntley Quarry. *Turn left onto this path and down to the quarry.

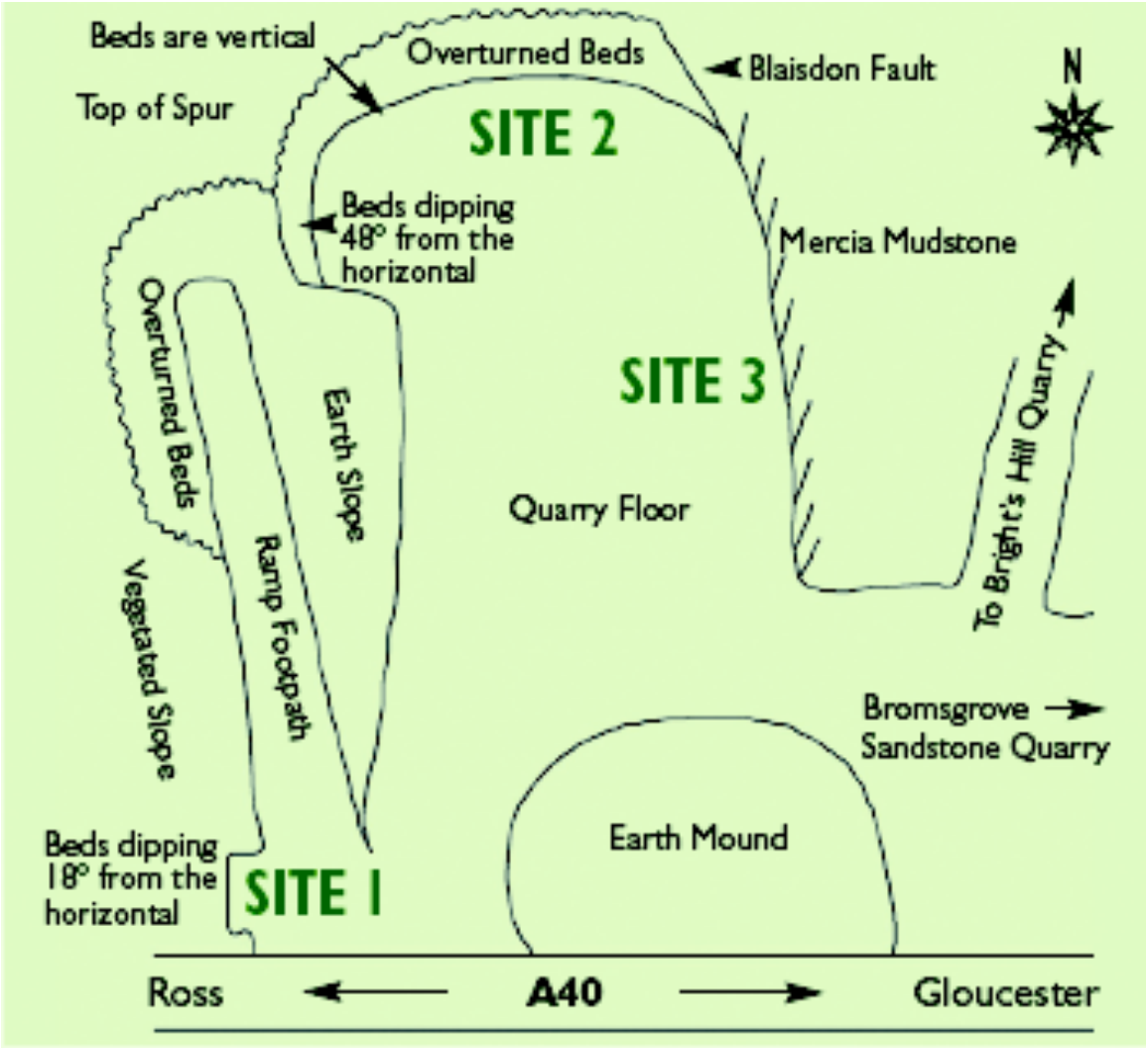
**Note:*
Turning right at this point will lead to Bright's Hill Quarry, another quarry on the reserve.

Safety:
It is not advisable to walk along any of the roads leading to the quarry as they are busy and there are no footpaths.
You are advised not to climb on the exposures as the rocks may be loose.
Keep back from the base of the quarry to avoid falling rocks.
The path leading to the quarry may be slippery in wet conditions.

Generalised map of the Reserve



Map of Huntley Quarry Geological Reserve



Links to the National Curriculum Key Stage 3 as follows:

Unit 8G: Rocks and weathering
- 8G/1 What are rocks made of?
- 8G/5a, 8G/6b, 8G/7c What happens to weathered pieces of rock
- 8G/9a, 8G/10b Why do sediments form layers

Unit 8H: The Rock Cycle
- 8H/1 How is sedimentary rock formed?
- 8H/6 Rock Cycle

Unit 7K: Forces and their effects
- 7K/1 Where do we come across forces?
- 7K/8a What does friction do?

Introduction to the geology

Huntley Quarry provides the opportunity to observe:

- various rock types (volcanic sediments, siltstones, coarse to fine grained sandstones and mudstones)
- dipping beds
- folded beds
- faulting in beds
- evidence of weathering and erosion

Site 1:

This is a small exposure of rocks at the entrance to the quarry.
It consists of fine-grained sedimentary rocks that were deposited in the Late Ordovician to Early Silurian era (445 – 439 million years ago). The British Isles were situated between 20^{O} and 30^{O} south of the equator at this time.
The rocks contain angular rock fragments of a variety of material including quartz, mica, glauconite, chlorite and feldspar. The angularity could suggest that the fragments haven't been transported far before deposition. Some of the fragments are volcanic material, including very fine volcanic ash, indicating that volcanic activity was happening fairly close to the site. The amount of volcanic material decreases on moving up through the sequence of rocks.
Points to note: transport and deposition of sediments can be mentioned here, as part of the rock cycle.
The pattern of decreasing volcanic material is a good example of how analysing evidence in the rocks can tell us what was going on in the surrounding environment.

Site 2:

The rocks at Site 2 are the Huntley Quarry Beds.
They consist mainly of sandstones and the finer grained siltstones. They belong to the same formation as the rocks in Site 1.
The rocks were deposited by rivers flowing into the sea.
The variation in the grain sizes of the rocks varied depending on the depth of the sea at the time and the size of river flowing into it. In places, the rocks can be seen grading from coarse grained to finer grained.
These rocks display interesting structures. They dip at an angle of 48^{O} from horizontal as a result of compressional forces occurring during a mountain building event some 390 – 310 million years ago. In places, the beds can be seen to thicken in the centre. It is thought that this is due to the rocks accommodating the huge forces acting on them.
At this time, the main fault (Blaisdon Fault) seen at this site was also formed. It resulted in the Huntley Quarry Beds lying next to the Mercia Mudstones.
Points to note: The variation in grain size of sediments can be linked to changes in energy of the river in which they are transported. The grading of grains within the beds can be linked to the deposition and formation of sedimentary rocks.
The folding and faulting are evidence that these beds were affected by tectonic forces i.e. the movement of plates.
Evidence of movement along the various faults can be found just to the right of the main fault where ***striations*** *or grooves can be seen on the rock surfaces. These help to show the direction of movement of each of the rocks as they scrape against each other and that friction must be operating on the rock surfaces. (This is in the KS3 Pupil Worksheet).*

Site 3:

At this site, the rocks mainly consist of mudstones from the Mercia Mudstone Group. They were formed 237 – 203 million years ago and are Triassic in age. By this time, the British Isles were approaching 20^{O} north of the equator.
They are silty mudstones and are red-brown in colour. Contained within them are beds of a harder, finely laminated mudstone and patches of grey-green mudstone (formed due to variations in the oxygen levels in the water during deposition and after). The beds would have formed in hot, arid, desert conditions with these beds being deposited in an inland lake periodically evaporating and flooding.
It is thought that during the Triassic and continuing into the Jurassic, more earth movements occurred resulting in the main Blaisdon Fault being reversed due to tensional (pulling apart) forces operating.
Points to note: This is another opportunity to make the connection between the evidence that forces have been applied to the rocks and larger scale plate tectonic processes.

Enjoy your visit!

Purchase and Conservation of Huntley Quarry kindly funded by

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