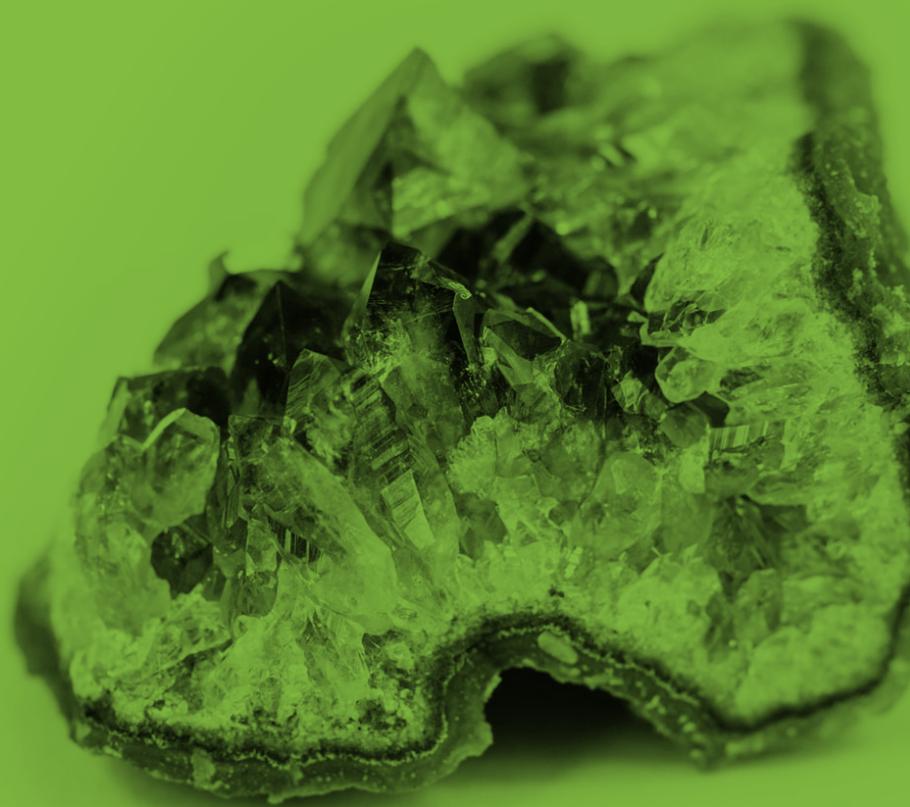


GCSE (9-1)

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GEOLOGY

Practical Guidance Sheet 8



GCSE Geology Practical Guidance Sheet 8

Title: The construction of graphic logs

Specification reference: 1.3e

Appendix B: refers to the need to construct graphic logs, to have knowledge and understanding of sampling and use of appropriate apparatus to record length.

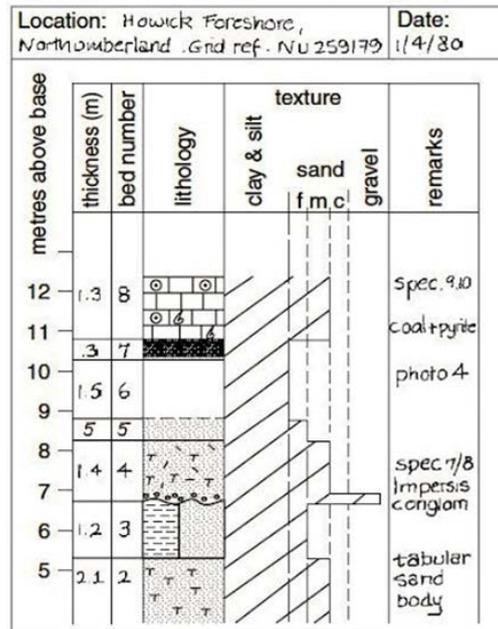
Aim: To construct a simple graphic log using appropriate scale and symbol sets for unfamiliar geological sequence and exposure.

Apparatus:

Tape measure
Sediment comparator
Hand lens
Graphic log template
Graphic log key
Pencil

Method:

1. Select a section of a sedimentary sequence to be logged. If relevant use a sampling method for locating the log, either systematic sampling or random sampling. Ideally the sequence will have continuous exposure. If not it may be necessary to move sideways along the section to find where the beds higher up the sequence are exposed so that a continuous record can be produced.
2. Decide on a vertical scale to be used e.g. 1:10 (1 cm to 10 cm).
3. Begin the graphic log at the base of the sequence.
4. Record the following features: bed or rock unit thickness, lithology (rock type), grain size, sedimentary structures, fossils and the nature of bed contacts (e.g erosive or sharp).



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Bed or rock-unit thickness

The bed thickness is measured with a tape measure. When the beds are dipping steeply and logging is taking place on a surface oblique to the bedding planes care must be taken to ensure that the true thickness of the beds is recorded.

Where thin beds of the same lithology occur together they can be grouped together into a single unit with one lithology on the log.

Where thin beds of different lithology rapidly alternate, e.g. interbedded sandstones and shales, they can be treated as one unit and notes made of changes in the relative thickness of these beds up the sequence.

Lithology (rock type)

On the graphic log, lithology is recorded in a column by using an appropriate shading in the key. If two lithologies are thinly interbedded, then the column can be divided in two by a vertical line and the two types of shading entered.

Texture (grain-size)

On the log there should be a horizontal scale for the grain size column. For many rocks this will show mud (clay + silt), sand (divided into fine, medium and coarse) and gravel. Having determined the grain-size of a rock unit, this is marked on the log and the area shaded (the wider the column, the coarser the rock).

Sedimentary structures and bed boundaries

Sedimentary structures within the beds can be noted in a "remarks" column.
e.g. cross bedding, graded bedding, ripple marks, desiccation cracks, lamination.

The bed boundaries can be recorded in the lithology column separating one bed from another. These boundaries may be

- erosive (shown as a wavy/irregular line)
- sharp (shown as a straight line)

Fossils

If fossils are found in the sequence, they can be noted in a “remarks” column.

e.g. corals, trilobite, ammonite, graptolite, plant, tracks, burrows.

The degree of fragmentation of the fossils may also be recorded in the “remarks” column.

‘Remarks’ column

This can be used for extra information regarding sedimentary structures, fossil content, amount of fossil fragmentation fossil, grain shape and sorting, as well as cross references to photographs or field sketches.

Analysis:

Each bed should be analysed to determine the environment of deposition of the sedimentary rock contained.

In this way, changes in the environment of deposition up the sequence (over time) can be determined.

Graphic logging is basically a list or diary of the rocks and their features in a “standard” format which enables interpretation of processes and environment and any changes.

Graphic logging may be practised in the laboratory prior to it being undertaken on fieldwork by construction of a “mock cliff face”.



A



B

This may be achieved by:

- **A** - a series of rocks are arranged in a length of gutter to build up a sequence or
- **B** - a 1 metre (or other) plastic tube (a suitably reinforced container that once housed a curtain pole is ideal) is filled with sediments of different types (to show a variety of mineralogy, textures and colours). To ensure a sharp, rather than a diffuse boundary between fine sediment overlying coarser sediment, it is best if the finer sediment is initially contained in a see-through plastic bag which prevents settlement into the open pore spaces in the coarser sediment below. With care, suitable sedimentary structures can be achieved e.g. load structures, graded beds, cross bedding.

Lithology

Devise suitable symbols to use for any sedimentary rocks/sediments you find in your graphic log

Breccia	Shale	Coal
Conglomerate	Limestone	
Sandstone	Evaporite	
Devise others as required		