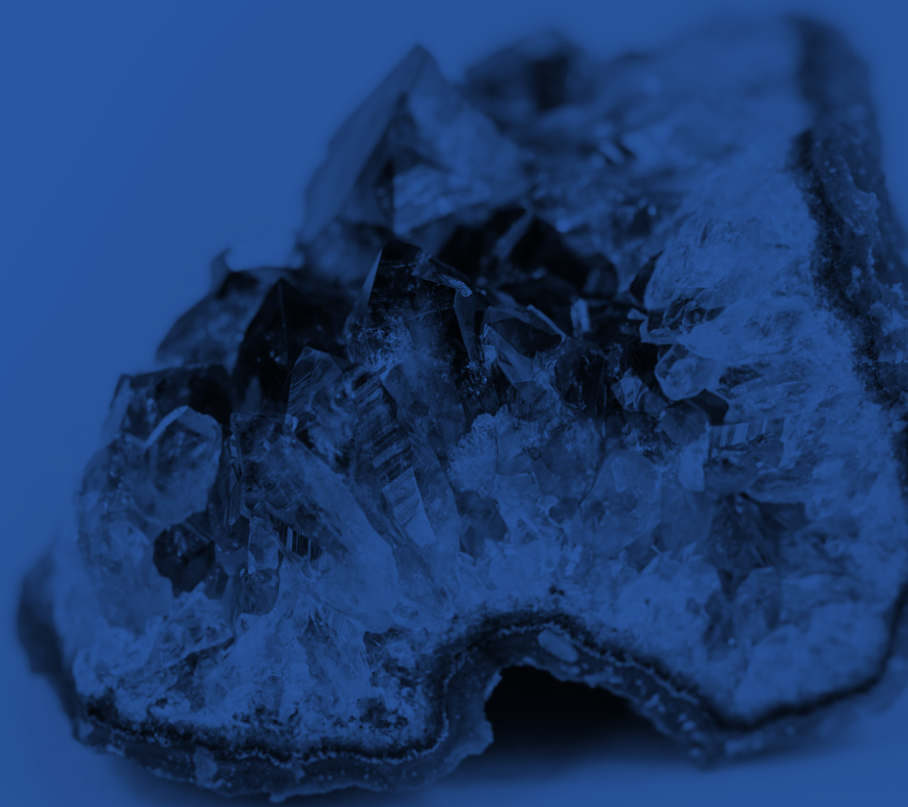


# WJEC Eduqas GCE A LEVEL in GEOLOGY

SP6 Construction of graphic logs  
using appropriate scale and symbol  
sets for unfamiliar geological  
sequences and exposures to record  
data relevant to an investigation



## Title: SP6 Construction of graphic logs using appropriate scale and symbol sets for unfamiliar geological sequences and exposures to record data relevant to an investigation

**Specification reference:** F2.1e

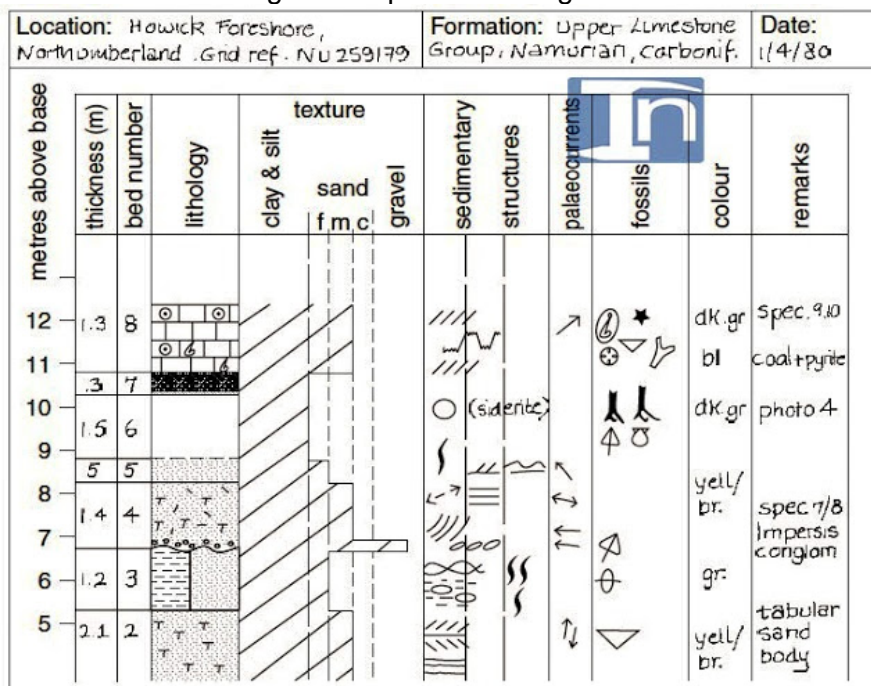
**Aim:** To construct graphic logs using appropriate scale and symbol sets for unfamiliar geological sequences and exposures to record data relevant to an investigation.

**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, grain size, sedimentary structures, colour, fossils and the nature of bed contacts (e.g erosive, gradational or sharp and planar).
5. Other features that may be logged include paleocurrent directions and additional textural features such as grain shape and sorting.



Features to be aware of:

### **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**

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. Gravel can be divided further if coarse sediments are being logged. 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 recorded in a column by symbols shown in a key. 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)
- gradational (shown as a dashed line)
- sharp and planar (shown as a straight line)

### **Palaeocurrent directions**

If required, these can be recorded on the graphic log as an arrow showing the compass direction and the measurements can be recorded separately in a field notebook.

### **Fossils**

Fossils indicated on the graphic log should record the main fossil groups present in the rocks. Symbols which are commonly used are shown in a key and can be placed in the fossil column. The degree of fragmentation of the fossils may be recorded in the 'remarks' column of the graphic log.

### **Colour**

The colour of a sedimentary rock is best recorded by a series of abbreviations e.g. bl = black, li gr = light grey.

### **'Remarks' column**

This can be used for extra information regarding sedimentary structures, texture, lithology, fossil preservation as well as cross references to photographs or field sketches.

**Analysis:**

Each bed should be analysed to determine the processes involved in deposition and 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.

**Teacher/Technician notes:**

Practical techniques which may be assessed:

D. Construct graphic logs using appropriate scale and symbol sets for unfamiliar geological sequences and exposures.

E. Use sampling techniques in fieldwork.

J. Use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature and length).

An example of a graphic log template (AS and A level)

## Lithology

Devise suitable symbols to use for any sedimentary rocks/sediments found in the graphic log.

Siliciclastic sediments		Carbonates	Others
Clay/ mudstone	Sandstone (undifferentiated)	Limestone (undifferentiated)	Coal
Shale	Conglomerate	Oolitic limestone	Evaporite
Siltstone	Breccia	Chalk	Volcaniclastic sediment
Devise others as required			

## Sedimentary structures

Devise suitable symbols to use for any sedimentary structures found in the sedimentary rocks/sediments.

Cross-bedding	Cross-lamination	Asymmetrical ripple marks	Erosive bed boundary
Graded bedding	Desiccation features	Load/Flame casts	Gradational bed boundary
Parallel Lamination	Symmetrical ripple marks	Flute casts	Sharp/planar bed boundary
Devise others as required			

## Fossils

Devise suitable symbols to use for any fossils found in the sedimentary rocks/sediments.

Brachiopod	Coral-colonial	Graptolite	Burrow
Cephalopod	Coral-solitary	Plant	Track/trail
Bivalve	Trilobite		
Devise others as required			

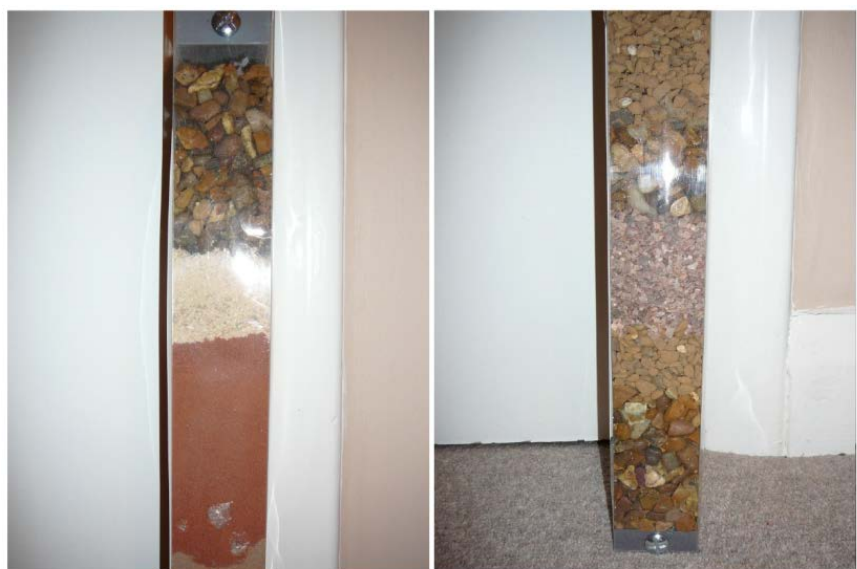
A suitable program for drawing and manipulating graphic log data (SEDLOG) can be downloaded free at <http://thames.cs.rhul.ac.uk/sedlog/>

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:

- putting rocks in a length of gutter to build up a sequence (**A**)  
or
- an alternative method (**B**) involves 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 – load structures, graded beds, cross bedding, imbricate structures etc.