

Questions for any rock face 14: recording

What questions about recording geological data might be asked at any rock exposure?

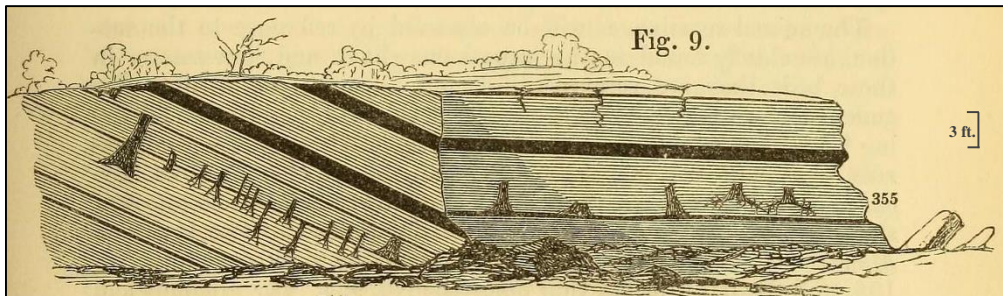
The ELI* series of ‘Questions for any rock face’ helps teachers to plan investigative fieldwork at any rock exposure**. In each case some possible questions are given, with some likely answers, to help you to decide whether the questions might work well at your site, or whether they would be asked better elsewhere.

Recording

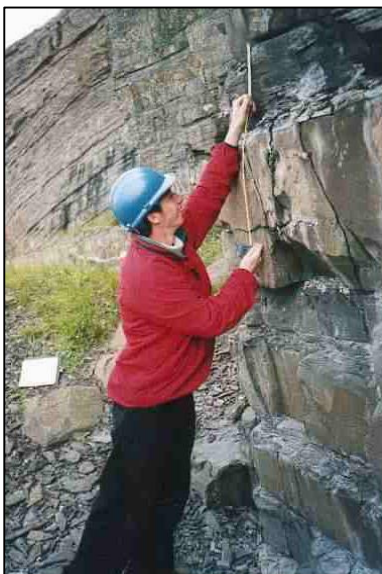
Ask your pupils these questions to help them to think about the different ways in which data could and should be recorded on site by a geologist.

Data need to be collected if records of the site are to be published.

Possible questions	Possible answers
If this site were to be filled in or destroyed, in what ways could the geological information be recorded for future use?	<ul style="list-style-type: none"> • Specimens of all the different rock types could be collected • Each of the rocks present could be described in detail • A continuous record of the layers could be made, from bottom to top • Measurements could be made of rock thicknesses, angles and directions • Scaled drawings could be made of all the key features on paper or electronically • Key features and areas could be photographed, and the photographs annotated • Maps or aerial photographs could be made • An exact survey of the area could be carried out • The site could be 3D-scanned by laser (LIDAR) so that the details could be ‘reconstructed’ digitally on a computer
Which of these ways would be best? Why?	The answer will depend on the rock type, features and situation. Sedimentary sequences could be logged (a continuous record made, from the bottom to the top). For all rocks, detailed rock descriptions, measurements and drawings/ photos of key features could be made. (Since to a professional geologist, the shape of the quarry is irrelevant, he/she would focus on other features)
Where should the records be held?	With a regional body such as a local museum or geodiversity organisation, or with a national body such as the geological survey



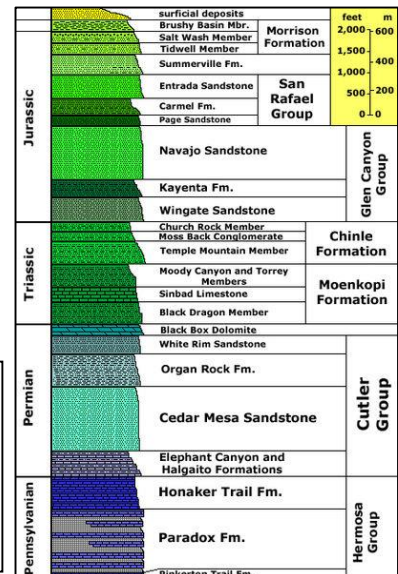
A field diagram recording the positions of fossil trees and coal seams, Cape Breton Island, Nova Scotia, Canada. Brown, R. (1850) Section of the Lower Coal-Measures of the Sydney Coal-Field, in the Island of Cape Breton. *Quarterly Journal of the Geological Society of London*, v6, p131.



Measuring bed thicknesses in the Aberystwyth Grits, Wales, UK. (Peter Kennett).

A stratigraphic log of the sedimentary sequence in the Canyonlands National Park, Utah, USA.

This work has been released into the public domain by its author, Rudolf Pohl at the German Wikipedia project. This applies worldwide.



* ELI = Earthlearningidea

** An exposure is where rocks can be seen at the Earth’s surface, exposed by natural or artificial means; anywhere where a rock reaches the surface, even if it is covered by soil, etc. is an outcrop, so an exposure is also part of an outcrop.

The back up

Title: Questions for any rock face 14: recording

Subtitle: What questions about recording geological data might be asked at any rock exposure?

Topic: Questions to encourage pupils to think about the best ways of recording geological data at an exposure.

Age range of pupils: 9-16 years

Time needed to complete activity: 10 minutes

Pupil learning outcomes: Pupils can:

- describe a range of ways in which geological information can be recorded at a field site;
- determine the most effective recording methods for the site in question.

Context:

Data-recording at a geological site is not as easy as it may first seem. First pupils need to determine which features should be recorded, then they need to decide the best ways of recording them for future use, either by themselves or others.

Moulds could be made of key features that might be lost, such as small fossil remains or footprint tracks using Plasticine™ or latex rubber; casts could later be made from these moulds.



Making rubber casts of tracks of *Hibbertopterus*, a Carboniferous water scorpion. (Dave Williams and Dee Edwards).

Remember to carry out a risk assessment before taking anybody to any rock exposure.

Following up the activity:

Continue with other 'Questions for any rock face' Earthlearningideas

Underlying principles:

- Geologists need to record data at rock exposures for future use, including possible publication, particularly if the site might eventually be lost.
- Decisions need to be made on the most effective ways of recording rock sequences or particular geological features.

Thinking skill development:

Determining which features need to be recorded and the most effective ways of recording them causes cognitive conflict.

Resource list:

- the resources needed for pupil fieldwork listed in the Earthlearningidea, '*Planning for fieldwork: preparing your pupils before setting out to "ask questions for any rock face"*'

Useful links:

A PowerPoint guide to geological field drawing by Maggie Williams can be found at:

http://pcwww.liv.ac.uk/geo-oer/index_htm_files/Field%20sketches%20&%20how%20to%20draw%20them.pdf

Details of the Earth Science on Site project are available at:

<http://wiki.geoconservationuk.org.uk/index.php5?title=Education>

Source: Devised by Chris King of the Earthlearningidea Team.

The 'Questions for any rock face' series of Earthlearningideas and the sites where they may be applicable

'Questions for any rock face' Earthlearningidea	Site
Planning for fieldwork	Preparation in school beforehand
1: weathering	Any exposure (cliff, coastal exposure, quarry, cutting) or weathered constructions (wall, gravestone, monument)
2: erosion	Any exposure and many walls
3: soil	Some exposures have a useful soil profile at the top (but many do not)
4: rock group (igneous or sedimentary)	Any exposure of igneous or sedimentary rock or both; also applicable to sedimentary and igneous building stones, gravestones or monuments
5: sedimentary grains	Any exposure of sedimentary rock and also building stones, gravestones or monuments
6: fossils	Any exposure containing readily found and obvious fossils, including some building stones, gravestones or monuments
7: tilted or folded rocks	Any exposure of clearly tilted or folded rocks
8: faults	An exposure where rocks are clearly faulted, preferably where beds can be matched up on either side of the fault
9: metamorphism	An exposure where metamorphic features are clearly visible and preferably, where there is also

	evidence of the former rock type
10: sequencing	An exposure where a sequence of geological events can be relatively dated using 'Stratigraphic Principles'
11. tectonic plates	An exposure of sedimentary rocks containing evidence of deposition in different climates and altitude/depths from today, with further evidence of plate margin processes
12. quarry/ cutting potential	An exposure in any quarry or cutting
13: quarry economics	An abandoned (or working) quarry
14: recording	Any exposure

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