

## Topic: Rock Identification

### ***Which Rock Is Which?***

This topic is designed to help pupils learn to look at actual rock specimens and become familiar with the main rock types that outcrop in the Knockan Crag area.

This topic is designed around the rock samples available at Knockan Crag.

All our evidence about the Earth's geological past comes from studying rocks and the fossils and minerals they contain. Although professional geologists have devised many technologically advanced ways of observing and measuring the properties of rocks, simply looking closely at a rock specimen is still one of the best ways of gathering information about its origins and about the processes that created it. Even young pupils (and their teachers!) can learn a surprising amount by examining rock specimens and using 'common sense' to answer some of the questions that spring to their minds.

However, before leaping ahead to interpret clues about the origins of rocks, it is important simply to learn how to describe them. Activity One is a good starting point that involves pupils in making observations and recording them. It has the advantage that it can be carried out by a few pupils at any one time, thus relieving the pressure when there are more pupils than there are rock specimens.

### **Activity One – *Collecting The Evidence***

The aim of this activity is simply to get pupils to look closely at rocks and to get some practice at describing what they see.

Because rocks are so incredibly varied in their appearance, describing them effectively is not as easy as might be first imagined. Before starting the activity, it is suggested that you establish with your pupils some form of structured approach to describing rocks. Support materials for this have been provided in **Rock identification - describing.pdf** and **Rock identification – rock description form.pdf**. Although the terms suggested are all everyday words, it is important that their particular meanings in the context of describing rocks are explored and understood.

- **Rock identification - describing.pdf** consists of a sheet setting out suitable headings that pupils can use to structure their descriptions together with advice on how to focus their observations on meaningful properties. The sheet itself is not particularly suitable for pupil use but it should prove useful as the basis of a teacher-led discussion on what to look for when examining rocks.
- **Rock identification – rock description form.pdf** consists of a standardised Rock Description Form that pupils can use to describe rocks. It is based on the rock properties explored in **Rock identification - describing.pdf**.

Since there are only eight rock specimens in the collection provided, the following strategy for examining them may prove useful. Each pupil can be asked to examine at least one of the specimens in their own time and complete a Rock Description Form. Once everyone has had a chance to produce at least one written description, the forms can be passed around for others to try and match the correct specimen to the description they have been given.

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Alternatively, you may wish to use your own collection of rock specimens for this activity. Since the object is simply to describe rocks, there is no need to know anything at all about the specimens you use. The only criteria should be that the rocks selected are clean, fresh and varied in their appearance. In many ways, it is preferable that pupils practise on your self-collected specimens since Activity Two focuses on the eight specimens in the collection.

### **Activity Two – Identity Parade**

The aim of this activity is to introduce pupils to the rather strange and obscure (as they must seem to non-geologists!) long-established names given to the rock units in the NW Highlands. It also provides an opportunity to gain further practice in examining the properties of rock specimens.

**Rock identification – rock specimen identification key.pdf** consists of a key that can be used by pupils to identify each of the eight specimens provided with this pack, using the rock properties explored in Activity One.

**Specimen clue cards.zip** and **Specimen info cards.zip** contain two sets of display cards each with the name of one of the eight rock units. These cards are for displaying with the specimens after they have been identified using the Identity Parade key. On the **clue cards** is a list of particular features to look for in the identified specimens. On the **info cards** is a series of bulleted items explaining the name and origin of the rock unit from which the specimen was collected.

It should be emphasised that the names given to the specimens in this kit are those of the local rock formation from which they were collected. This name may not include the common name of the rock type that makes up the formation. For instance, the rock specimen from the Fucoïd Beds is a mudstone, a common type of sedimentary rock. Similarly, the specimen representing the Pipe Rock formation is a type of hard sandstone. The other local rock formations from which specimens have been collected all include the main rock type in the formation name eg Durness Limestone.

Emphasis is placed on the formation names because these are the names used in all the displays at Knockan Crag.

### **Note About Naming Rocks**

Many teachers lack confidence in naming rocks and somehow feel 'inadequate' as a result. However, be reassured - even experienced professionals cannot always identify hand specimens of rock by just looking at them. Some rocks may require examination under a microscope or even chemical analysis before an accurate name can be given to them. Naming (as opposed to describing) pupil-collected rocks can be a very tricky (and usually very speculative) business. It is also a rather pointless exercise for teachers and pupils if naming is regarded as an end in itself. It is much more valuable for pupils to learn how to describe a rock and perhaps recognise features that may shed light on its origin.

The reality is that it is not always easy or even possible to allocate a rock to membership of one of the three rock 'families' – igneous, metamorphic and sedimentary. While it is necessary for pupils to understand the ways in which rocks belonging to these families are formed (*5-14 ES Guidelines page 49*), it will never be possible realistically for them to be

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able to pick up a random specimen and be definite about whether it is igneous, metamorphic or sedimentary.

Note also that there are no igneous rocks in the Knockan Crag collection since igneous rocks do not feature in the Knockan Crag story. Instead, the initial focus is on the formation of sedimentary rocks, with additional information about the formation of metamorphic rocks coming towards the end of the story. A separate mini-project on volcanoes might be a good way of introducing and studying igneous rocks.