

## Geology Detectives

### Limestone – a brief introduction to its identification on OS maps

Limestone is a **sedimentary** rock. It is formed from the skeletons and shells of tiny organisms that used to live in a warm tropical sea. These have been compressed by pressure over millions of years. The resulting rock has regular horizontal beds (or **bedding planes**) and vertical cracks (called **joints**). These allow water to penetrate the rock, which is therefore **permeable**. The rock is made from calcium carbonate, which is dissolved in rainfall (which is weak **carbonic acid**)

### Characteristics

- Little surface drainage – streams can also be intermittent: sinking beneath the ground and then re-emerging some distance later
- Few lakes or streams
- Thin soils mean few trees and little farming other than sheep grazing
- Rock outcrops at the surface – called scars, may also be labelled pavement
- Valleys exist with no surface streams – dry valleys – formed when the ground was frozen during the Ice Age
- There will be lots of small depressions, which may be labelled shake holes
- Field boundaries are made of stone walls rather than hedges
- Flat areas of limestone are eroded to create limestone pavements with regular blocks of granite separated by cracks
- Evidence of quarrying will be found
- Evidence of earlier land use e.g. cairns, tumulus, field systems

### Particular words found on the map in limestone areas

Shake Holes – another word for dolines or depressions in limestone scenery

Scar – rock outcropping at the surface, with no soil covering it

Pot holes – small depressions in the ground, not to be confused with caves

Caves / caverns – found in limestone areas, these often have stalactites and stalagmites

### Images of limestone landscapes

<https://www.flickr.com/photos/sagt/sets/72157623320563104/> - with thanks to Val Vannet

### Websites

<http://www.bbc.co.uk/scotland/education/int/geog/limestone/>

[http://www.bbc.co.uk/schools/gcsebitesize/geography/rock\\_landscapes/rock\\_types\\_rev2.shtml](http://www.bbc.co.uk/schools/gcsebitesize/geography/rock_landscapes/rock_types_rev2.shtml)

<http://www.geographypods.com/limestone-landscapes.html>

<http://www.bbc.co.uk/learningzone/clips/limestone-landscapes/3250.html> - BBC Video

## Granite – a brief introduction to its identification on OS maps

Granite is an igneous rock, which is formed as a result of **volcanic** activity, often beneath the surface. Because the rock cools down slowly, it tends to have large crystals of different **minerals**, particularly quartz. These minerals intrude into the rocks, above and around them, and may be revealed when the rocks above them are eroded over time. Granite is a very hard rock, but once exposed to the elements, it breaks down through **chemical weathering**. Rainwater dissolves away one of the minerals that makes up the granite, causing it to decay. Granite is an **impermeable** rock: it doesn't allow water to pass through it, so water collects on, or runs over the surface, resulting in lots of marshes and bogs. Rock outcrops are eroded to form distinctive stone features called **tors**.

### Characteristics

- Plentiful surface drainage – collects in depressions to form small lakes and streams
- Steep sided valleys formed by the water over time
- High land
- Peat bog develops in saturated low lying areas
- Tors: castellated rock features on the tops of high ground
- Thin and poor soils mean little farming other than sheep grazing
- Evidence of earlier land use: cairns and paths over the moor, and hut circles
- Evidence of earlier quarrying and trackways for movement of stones

### Particular words found on the map in granite areas

Tor – distinctive rock features caused by weathering of granite – often surrounded by block fields of loose stones which have fallen off them – high ground may also be given the name 'Beacon'

Bog – marsh or mire – this is also shown on the OS key using symbols



Downs – high heather-covered areas

Quarries - china clay or kaolin are formed when granite is weathered – these have sometimes been re-used, most famously at the Eden Project in Cornwall

Scars – rock outcrops at the surface

### Image of granite landscapes

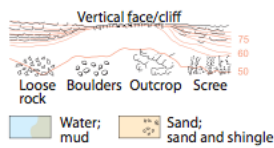
<https://www.flickr.com/photos/sagt/sets/72157623423174106> - with thanks to Val Vannet

### Websites

[http://www.bbc.co.uk/schools/gcsebitesize/geography/rock\\_landscapes/rock\\_types\\_rev1.shtml](http://www.bbc.co.uk/schools/gcsebitesize/geography/rock_landscapes/rock_types_rev1.shtml)

## OS Map Key

### Surface Features on maps



Limestone landscapes will have plenty of outcrop symbols where scars occur at the surface.

The slopes below tors in granite landscapes will tend to have plenty of loose rocks.

### Tourism Features (some of which are influenced by geology)

#### TOURIST & LEISURE INFORMATION

Building of historic interest	Country park	Information centre	Parking	Telephone (public / motoring organisation / emergency)
Cadw (Welsh heritage)	Cycle trail	Information centre, seasonal	Park and ride, all year / seasonal	Theme / pleasure park
Camp site	English Heritage property	Horse riding	Picnic site	Viewpoint
Caravan site	Fishing	Museum	Preserved railway	Visitor centre
Camping and caravan site	Forestry Commission visitor centre	Nature reserve	Public Convenience	Walks / trails
Castle / fort	Garden / arboretum	National Trust property	Public house/s	Water activities
Cathedral / Abbey	Golf course or links	Other tourist feature	Recreation / leisure / sports centre	World Heritage site or area