ROUTE CARD 3 - Malham Classic Seven circular walk

Estimated 2.5 hrs, 7 miles, involving some climbing, especially Gordale Scar impasse which maybe impossible in wet weather. Suitable for older children.

ROUTE CARD 3 – MALHAM CIRCULAR WALK

APPROX TIME 2 ½ HRS INVOLVING SOME CLIMBING, ESPECIALLY NAVIGATING GORDALE SCAR IMPASSE WHICH MAY BE IMPOSSIBLE IN WET WEATHER. SUITABLE FOR OLDER CHILDREN.
THE WALK PASSES MANY POINTS OF INTEREST INCLUDING MALHAM COVE, LIMESTONE PAVEMENTS, GORDALE SCAR, JANET'S FOSS AND HIDDEN CAVE – WHILST THERE IS ALSO A NATIONAL PARK VISITOR CENTRE AT MALHAM AND VARIOUS AMENITIES

USE OUTDOOR LEISURE MAP 2 - YORKSHIRE DALES SOUTHERN & WESTERN AREAS, SCALE 4CM:1KM
NOTE: ALL BEARINGS ARE GRID NORTH **NOT** MAGNETIC BEARINGS

NAME	**DISTANCE**	**COMMENTS**	**APPROX TIME**
YHA MALHAM 901 629	1.4 KM	FOOTPATH TO MALHAM COVE BEARING 345	18 MIN
MALHAM COVE 897 641	1 KM	FOLLOW PENNNE WAY TOWARD MALHAM TARN BEARING 327	13 MIN
JUNCTION PATHS 892 648	0.8 KM	FOLLOW FOOTPATH TOWARD MALHAM TARN BEARING 17	10 MIN
JUNCTION PATHS 894 655	1.6 KM	BEFORE MALHAM TARN AT JUNCTION OF PATHS FOLLOW FOOTPATH BEARING EAST 109	21 MIN

JUNCTION PATH & ROAD 906 651	0.1 KM	FOLLOW RD N UNTIL YOU REACH FOOTPATH ON YOUR RIGHT BEARING350	1 MIN
JUNCTION PATH & ROAD 906 652	1.6 KM	FOLLOW PATH TO GORDALE SCAR BEARING 135	21 MIN
WATERFALLS 915 641	0.7 KM	SCRABBLE DOWN GORDALE IMPASSE & FOLLOW FOOTPATH TO GORDALE LANE BEARING 195	9 MIN
JUNCTION PATH & ROAD 913 635	0.3 KM	FOLLOW RD TOWARD MALHAM BEARING 235	4 MIN
JANET'S FOSS & HIDDEN CAVE 911 633	1.6 KM	LEAVE RD AND FOLLOW FOOTPATH THROUGH JANET'S FOSS UNTIL YOU REACH THE PENNINE WAY BEARING 215	21 MIN
JUNCTION PATH & PENNINE WAY 902 624	0.6 KM	FOLLOW PENNINE WAY NORTH TO MALHAM AND STARTING POINT BEARING 350	8 MIN

DIRECTIONS TO MALHAM FROM ESHTON GRANGE

FROM ESHTON GRANGE TURN RIGHT ON ESHTON ROAD AND FOLLOW THROUGH THE VILLAGE OF AIRTON AND KIRKBY MALHAM. AT KIRKBY MALHAM T-JUNCTION TAKE THE ROAD TO YOUR RIGHT TO MALHAM.

FOLLOW SIGNS FOR CAR PARKING IN VILLAGE. **ESTIMATED JOURNEY TIME 15 MINS.**

MALHAM TARN

The inspiration for Charles Kingsley's classic children's novel, *The Water Babies*, Malham Tarn is a small circular lake of less than a mile in diameter formed through the action of glaciation in the last ice age. At an altitude of 376.6m above sea level, the Tarn covers about 153 acres, with an average depth is 2.4m and the maximum depth is 4.4m .The catchment area covers about 6 km, whilst average rainfall is 1542.5 mm per year. The retention time (vol./discharge) of the tarn is 11 wks..

The inflow to the Tarn consists of a small stream entering at the north-western corner and to a lesser extent the small springs that issue from close to the limestone/shale boundary at the base of the limestone scar ("Grt. Close") on the eastern shore. There is one outflow:

At the south end of Malham Tarn, the infant River Aire sets off on its long (and complicated) journey to the North Sea. The journey is complicated because, just a few hundred yards from leaving the tarn, the river mysteriously vanishes through deep fissures in its limestone bed at a place called, Water Sinks.

For many years, it was believed that this river was the same as Malham Beck, reemerging further down the valley at the base of Malham Cove. However, this is not the case, as flourescene dye tests have now proved that the river disappearing underground at Water Sinks does not actually reemerge until much further downstream, at a place now called Aire Head Springs south of Malham village, and near to Bell Busk ! [Malham Beck, meanwhile, appears to originate at another location on Malham Moor, before also disappearing underground to resurface at Malham Cove.]

It is clear that, whatever routes are actually taken by these streams underground, an extensive network of cave systems lies waiting to be discovered, despite the efforts of cave divers to penetrate the depths of the submerged boulder crawl beneath Malham Cove.

THE DRY VALLEY OF WATLOWES

Below Water Sinks, and above Malham Cove lies a deep limestone canyon known as the Dry Valley, or Watlowes Valley. Whatever underground route the streams of Malham Moor now take, Watlowes Valley was almost certainly carved out by the glacial overspill from Malham Tarn flowing to what was once England's highest waterfall at Malham Cove. Now the valley is dry, but contains some most impressive limestone.

MALHAM COVE

Malham Cove is a huge natural limestone cliff, 286 ft high, which was once the scene of a spectacular prehistoric waterfall. The valley above the cove is now dry, with the river having found an alternative route through an undiscovered cave system deep underground. However, at the foot of the cliff, a small stream called Malham Beck rises from a submerged cavern, which is still being explored by cave divers.

LIMESTONE PAVEMENTS

Limestone pavements are the product of glacial action during the last ice age approximately ten thousand years ago, the movement of the glaciers stripping away the surface layers of soil to leave the underlying limestone bedrock exposed. The scouring action of the glacial ice created the level gently sloping platforms we see today whilst continued erosion by acidic rain and ground water has widened and deepened cracks and fissures in the rocks, to form the characteristic channels called **Grikes**.

The Limestone bedrock itself formed around 300 million years ago in the Carboniferous era, and are composed of the outer "shells" of countless millions of sea creatures, piling up upon each other as they died to form a sediment on the sea floor. Under immense pressure's this sediment has formed Limestone and subsequent movement of the earth's crust has lifted the sediments above sea level.

Limestone pavements are home to 16 species of rare or endangered plant species, and the deeper grikes provide sheltered and moist conditions suiting a range of plants more commonly associated with woodland e.g. Herb Robert, Dog's Mercury.

Limestone pavements are very rare and in Britain only occurring in small pockets of North Yorkshire, Lancashire and Cumbria. Altogether there are only some 2600 hectares in Britain of which 97% has already been damaged. Help protect our environment and do not buy water worn Limestone.

SHAKE HOLES

These are depressions in the ground formed through water erosion of the underlying limestone. Limestone has natural cracks, through which surface water can drain. These are made larger, as water actually dissolves away the rock and small streams form in horizontal cracks under the surface. Shake holes form where the ground above these shallow, underground streams has caved in.

CHEMISTRY OF LIMESTONE

Limestone itself is composed of Calcium Carbonate $CaCO_3$, which is practically insoluble in water. In the presence of dissolved Carbon Dioxide from the air however, the limestone dissolves to form Calcium bicarbonate.

$CaCO_3 + CO_2 + H_2O = Ca(HCO_3)_2$

The resultant bicarbonate solution decomposes, slowly in cold and rapidly on boiling or warming, to produce a precipitate of Calcium Carbonate.

$Ca(HCO_3)_2 = CaCO_3 + CO_2 + H_2O$

It is this decomposition of the bicarbonate which is responsible for the formation of stalagmites and stalactites in underground caves and water ways, and for the furring of kettles.

GORDALE SCAR

A great limestone gorge some 400 feet (150 m) deep, Gordale Scar is believed by many geologists to be the remains of a huge underground cavern whose roof collapsed around the time of the last ice age. Gordale Beck cascades down the ravine in two spectacular waterfalls, one of which pours through a natural arch in the rock above. A short scramble takes visitors (at their own risk !) up the tufa* deposits at the side of the first waterfall into the top section of the gorge, which leads out onto Malham Moor.
* = Tufa is a smooth limestone deposit usually formed when water containing calcium carbonate passes over exposed rock. Besides Janet's Foss, other examples of this type of deposit can be seen at Janet's Foss (see below).

JANET'S FOSS AND JANET'S CAVE

A picturesque waterfall due south of Gordale Scar, Janet's Foss is where Gordale Beck cascades over a tufa* capped limestone outcrop into a deep pool in a wooded limestone gorge. On the far bank is Janet's Cave, a dark hole which actually leads nowhere.
From Janet's Foss, Gordale Beck flows through woods and then open fields before meeting up with Malham Beck, just south of the village. Further downstream, this tributary meets the stream issuing from Aire Head Springs (actually the infant River Aire) on its journey down towards Skipton.