



MOORLAND DISCOVERY

A Guide for Teachers and Group Leaders to the
Outdoor Classroom in the Peak District National Park

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Outdoor Classroom in the Peak District National Park

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Getting Started

Welcome to the Moorland Discovery Teachers Pack by the Moors for the Future Partnership. This pack is designed to help teachers and group leaders to lead a safe and fun visit to the moorland areas of the Peak District National Park. The pack is aimed at supporting both class and field-work for students from Key Stage 1 to Key Stage 4.

Background/Activities

The content of the CD-Rom is broken up into themes which should help you to find an activity idea or background information in the area you're interested in. Each theme has fact sheets to provide some background information and some suggested activities. There are a range of activities for all ages, for indoor and outdoor fun and learning.

The theme areas are:

1. Introduction – helpful information and ideas when organising a visit
2. Geology KS2-3
3. Peat KS2-3
4. Ecology KS1-3
5. Water KS2-3
6. Moorland Management KS3-4
7. Recreation KS2-4
8. Climate Change KS1-4
9. Histories and Stories KS2-3

More information, up-to-date fact sheets and new games are available at:
www.moorsforthefuture.org.uk

Looking for some extra information?

www.moorsforthefuture.org.uk

www.peakdistrict.gov.uk

www.nationaltrust.org.uk

www.ramblers.org.uk

For a list of useful links on all topics covered in this pack and information about the Peak District National Park:

www.peakdistrict-nationalpark.info

Contact details:

Peak District National Park Authority
Aldern House
Baslow Road
Bakewell
Derbyshire DE45 1AE

Telephone: 01629 816200

Fax: 01629 816310

The National Trust
Longshaw Estate
Sheffield
Derbyshire S11 7TZ

Telephone: 01433 367 907

Fax: 01433 630629





Visiting the Peak District National Park

Why visit the Peak District moorlands?

Dramatic gritstone edges, wild heather moorlands and gentle limestone dales make the Peak District National Park one of Britain's best-loved landscapes. Shaped by humans over thousands of years, the Peak District is a 'living landscape' that supports a rich diversity of wildlife, culture and heritage.

Moorlands are one of our most precious and wonderful environments within the UK. They are also one of our least understood. Moorland is an internationally rare habitat, supporting many rare and unusual plants and animals. Within the UK we are very lucky to have such a large and accessible area of moorland.

Venues for a Peak District National Park visit

> See map of the Peak District showing nearby towns and cities, main routes and railway lines, and links to the places below:

The Moorland Discovery Centre – at The National Trust's Longshaw Estate

Facilitated visits can be booked at this centre, see lesson list

Other facilities: classroom facility, toilets, coach parking, on a bus and train line

Contact details: Moorland Discovery Centre

Tel: 01433 637907 Fax: 01433 637905

For more information about lessons available at the centre:

www.moorsforthefuture.org.uk/mftf/learning/activities.htm

The Longdendale Environmental Centre – at United Utilities, Tittesworth Reservoir

Facilitated visits can be booked at this centre

Other facilities: classroom, toilets, coach parking, train line

Contact details: Longdendale Education Officer on 01457 868127

The Moorland Centre – Edale

Talks can be booked and some Ranger-led visits are available with prior discussion

Other facilities: bookable room, toilets, coach parking at entrance to village, information and displays on moorlands, Edale station nearby

Contact details: 01433 670207

www.moorsforthefuture.org.uk

Losehill Hall, National Park Authority Centre for Environmental Learning – Castleton

A range of environmental-based courses and educational visits available

Contact details: 01433 620373

www.peakdistrict.gov.uk

YHA Edale

YHA Castleton

YHA Hathersage

Contact details: 01433 670225 Edale 01433 620235 Castleton

Outdoor adventure at Edale and a range of learning opportunities at Castleton.

www.yha.org.uk



Visiting the Peak District National Park – continued

The National Trust Peak District Estates

Learning Officers are available to lead environmental learning activities at each of the NT properties:

Contact details:

High Peak: 01433 670368

Longshaw: 01433 637907

South Peak: 01335 350549

www.nationaltrust.org.uk/learning

Langsett Barn – at Langsett near Stocksbridge, Penistone and Barnsley

Bookable classroom holds 60 students, no set programmes available

Other facilities: tables and chairs, toilets, coach parking x 2, kitchen

Contact details: to book the Barn 01629 816211

Other information: this is a good site for river studies, moorland ecology and tourism. If you don't wish to lead your own visit to the site you can book a visit through Losehill Hall or talk to the Rangers who may lead a talk or a walk to help support your visit. There is also the Langsett Fact Finder available which looks at the water and history of the valley. You can book a pre-visit to look at the facilities with the caretaker on 01226 767414.

Dove Stone Reservoir – near Uppermill, Oldham

No indoor space available

Other facilities: toilets, coach parking, Ranger base on site

Contact details: 01457 820728

Other information: this is a wonderful site to visit, with suitable sites for river studies and easy access walks. This site also has good views of the surrounding moorland habitat. Access to the moorland from this site is on foot only.

Fairholmes Visitor Centre – Derwent Valley

No indoor space available

Other facilities: toilets, information centre/shop, food kiosk, picnic area, coach parking, good way-marked walking routes and cycle hire.

Contact details: Ranger base, 01433 659986

Other information: access to the moorland from this site can be more difficult and involve an uphill walk. However this site has wonderful views and a system of reservoirs, forestry and river habitats. This is a very popular site for visitors for easy walking around the reservoirs and cycle hire. Rangers can be booked prior to your visit to give a free introductory talk about the management of the area, or are available prior to your visit to help with advice on the best walk to take.

The Roaches and Ramshaw Rocks

No facilities and no indoor space

Contact details: Marsh Farm 01538 300135

Other information: this is a fantastic area for studying contrasting habitats and moorland vegetation. This area has easy walking access onto the moorland but unfortunately very little parking and other facilities. There is a visitor centre at Tittesworth reservoir with toilets, information centre and coach parking. With prior booking the Ranger can deliver a free introductory talk and help support your visit.

North Lees and Stanage – above Hathersage and Grindleford

No facilities or indoor space

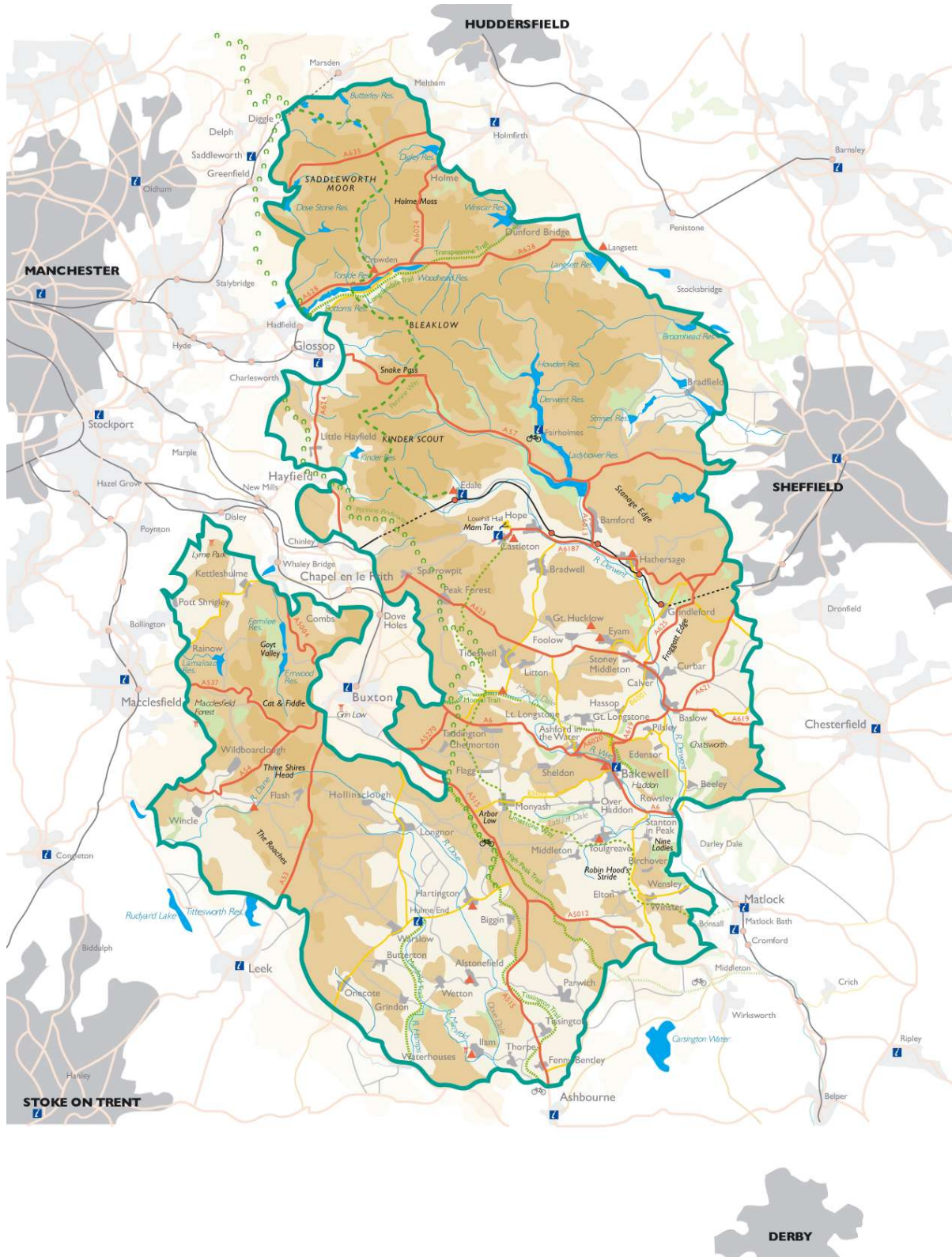
Car parks are situated along the road that runs parallel with Stanage Edge

Trains run from Sheffield and Manchester to Hathersage and Grindleford Stations

Ranger contact number: 01433 650704



Peak District National Park Area Map





Health and Safety Teacher's Notes

We are all keen to make sure that when you and your group visit the moors you have a safe and enjoyable visit. Please read the following information carefully.

Clothing

The natural environment is generally very safe; however, there are certain precautions that can be taken to make it even safer and to help ensure that you all enjoy your visit.

It is generally cooler and wetter when you get up onto the moorland. Even if it's a nice day when you set off, always be prepared for a change in the weather.

Always take a hat – a woolly hat will keep lots of heat in during cold days and during the summer a cap will stop you getting sun burnt.

Always take a thick jumper and a waterproof – this will keep the rain and wind off.

No jeans – if jeans get wet they stay wet and cold for a long time. If you have any waterproof trousers take them just in case.

Old clothes – the countryside can get muddy and wet so to save worry and to enjoy your visit wear all old clothes.

Sensible footwear – even on hot days sandals and heels are never a good idea, as the ground can be rocky and uneven. Trainers, boots and wellingtons are best to get the most from your day.



At least I look good!!

You may feel – cold wet uncomfortable fed-up
agitated unhappy grumpy



Cosy clothes

You may feel – dry warm cosy focused
happy comfortable

Remember to bring a rucksack and a BIG packed lunch; walking in the fresh air makes you hungry and thirsty so don't forget your packed lunch and a drink. Please think about what you bring your lunch in and how much packaging you have. Make sure you leave your picnic site clean and tidy.



General Hygiene Recommendations

The following information offers recommended guidance for reducing the risks of contracting various bacterial and viral diseases found in the general environment.

Teachers should ensure that all pupils have an up-to-date **tetanus vaccination**. Teachers, leaders and helpers should **encourage hand washing prior to lunch**, and should particularly ensure that it takes place in the case of KS1 pupils. Teachers, leaders and helpers should **encourage hand washing after pond or stream work**. If necessary, providing wet wipes for hand cleaning is a good idea. Open cuts and grazes should be covered with waterproof plasters or plastic gloves.

Raise awareness of potential hazards for bacterial/viral disease where appropriate.

Summary information on bacterial and viral diseases

Tetanus occurs when an open wound is contaminated by bacteria, which are found in soil anywhere in the UK. Symptoms: flu-like, followed by stiffening of the jaw, potentially fatal.

E-coli 0157 is carried in animals e.g. cattle, rabbits, and is transmitted via faeces/direct contact to humans by ingestion. Relatively rare but children under the age of 7 are more vulnerable. Symptoms: 1–6 days mild diarrhoea, causes kidney problems in 15% of cases.

Lyme Disease is caused by a bacterium that is transmitted by tick bites e.g. carried by deer, squirrels and dogs. Ticks carrying the bacterium are present in both rural and urban areas. Symptoms: circular rash spreading from the site of the tick bite, followed by tiredness, headaches, and flu-like symptoms.

Weil's Disease is caused by the Leptospirosis virus transmitted through animal urine e.g. from cattle, rats, into watercourses and then being taken in by humans through broken skin or the mouth. It can be found in both rural and urban water environments. Only about 80 cases per year in the UK. Symptoms: flu-like and severe headaches 3–19 days after exposure to contaminated water, occasionally more serious.

Toxicara is a parasitic worm transmitted through contact with dog faeces and soil. It can cause eye damage.

Toxoplasma is a parasitic worm transmitted through contact with cat faeces. Symptoms: mild flu-like. Can be particularly dangerous for pregnant women.

Chlamydia is transmitted through contact with an infected animal's body fluid. This is primarily of concern for pregnant women, who should avoid visiting farms at lambing time as infection can cause miscarriage and kidney failure. Symptoms: flu-like.



The Role and Responsibility of Teachers and Helpers

When organising an independent visit to the moorland there are some useful tips to think about:

Visit the site you intend to use prior to your visit.

If you would like to talk to the local Ranger or Warden about your visit, or the best places to take a group, please see visits map for contact details.

Let the Ranger/Warden know you're coming and the number of students you will be bringing. This is important as they can tell you if any work is going on in the area which may affect your visit and, in the case of any difficulties, they may be a good first point of call.

Be aware that in many areas mobile phones don't work.

Plan your route and make sure the school office has a copy of your expected return time in case of emergency.

Make sure you take a first aid kit, qualified first aider, extra clothing, a whistle, a mobile phone, map and a survival shelter if you have one (this is good even if someone twists an ankle, as if it's windy and cold it's good to be able to have a dry shelter).

We recommend a student to staff ratio of 10:1 for KS2/3, 6:1 for KS1. Ensure that the **school or LEA has appropriate insurance cover** for the visit. Make sure your risk assessment is up-to-date and in line with Local Authority guidelines. It helps to include a map with potential hazards marked on it. www.teachernet.gov.uk is a Defra website with advice and guidelines on health and safety for educational visits.

Prior to the day, and on the day, check the weather reports. The weather up on the moorland can be very different to that of the valleys and towns. Always expect it to be a few degrees cooler, windier and wetter. Don't let this put you off, it can add a lot to the visit; however, young people can be put off visiting the moorlands for life if they spend a day being cold, wet and miserable, so do try to be flexible about your day's plans. Make sure you have planned a safe route off the moors.

IMPORTANTLY – if you are planning a river visit, be aware that heavy rain during the week prior to your visit may have raised the water level in the streams.

Have a look with your group at the Moorland Code and try to ensure that all the members of your group follow it.

There are guidelines and qualifications for leading groups in the hills. Please check the Mountain Leaders' Association website for details of Walking Group Leader courses if you feel it's appropriate for your needs. www.mlte.org



Visiting the Moorland Discovery Centre

1. If you would like to organise a visit with staff at the Moorland Discovery Centre, please have a look at the learning programme available on the Moors for the Future website www.moorsforthefuture.org.uk or ring the centre 01433 637907.
2. Ring the centre to make a provisional booking. We'll send you a booking form to complete and return to us.
3. All of our activities will involve being outside. Weather conditions can vary so warm, weatherproof clothing and suitable outdoor footwear are essential. NB. Wellington boots will be needed for river work. Activities may have to be changed or cancelled in the event of severe weather conditions.

For school visits, responsibility for pupils' behaviour rests with the teacher at all times.

We do write risk assessments for all activities; however, the overall responsibility for risk assessments lies with the visiting group leader.

All school groups must provide a minimum of one adult (not including site-based staff or volunteers) for every ten children in order for the activities to take place.

For health & safety reasons group numbers may be limited for certain activities.

Pre-visits by teachers are welcomed.



The Moorland Discovery Centre



Example Risk Assessment – River Studies

LOCATION ACTIVITY EQUIPMENT DATE OF ASSESSMENT ASSESSOR REVIEW DATE	Burbage Valley, Padley Gorge and Longshaw Estate River Studies Metre rule, measuring tape, dog biscuits 25/10/2006 Peak District National Park Authority 25/10/2007					
Hazard	Persons at Risk	Existing Preventative Measures	Probability	Severity	Rating	What/Who
Inappropriate activities near and in water that lead to drowning	Young people in group, leaders	Leaders to provide good instruction and ensure excellent group management. Teachers to assist leaders and ensure excellent group discipline is maintained.	1	4	4 (Low)	No additional action required
	Teachers and parent helpers	Leaders trained in first aid, group leadership, hazard perception and carry first aid kits and emergency shelter. Leaders in contact with emergency services using mobile phone/radio.				
		Teachers to ensure that group have been properly briefed prior to visit and at least some of group (e.g. those to take measurements) bring wellingtons as well as good walking shoes.				
		Leaders to check group footwear and availability of wellingtons for carrying out measurement activities. Leaders to provide boots if available and convenient or can choose to curtail visit if necessary.				
		Leaders to instruct group and ensure that they are aware of their working boundaries. Teachers take responsibility for pupils' behaviour.				
		Leaders aware of daily weather report and daylight hours before beginning activity and can choose to curtail visit if water levels deemed unsafe.				
Slippery banks, steep slopes, moorland groughs and rocks causing people to fall	Young people in group, leaders	Teachers to ensure all members of group are using appropriate footwear. Leader can choose to curtail visit if group are inadequately equipped.	6	1	6 (Med)	No additional action required
		Leaders to guide group through safest route and caution group of potential dangers.				
	Young people in group, leaders	Teachers to assist leaders in ensuring pupils use appropriate and safe routes at all times.				



Example Risk Assessment – River Studies – continued

Hazard	Persons at Risk	Existing Preventative Measures	Probability	Severity	Rating	What/Who
Extreme weather conditions leading to hypothermia or heat exhaustion or hypothermia caused by member of group falling into water	Young people in group, leaders	Teachers to ensure all members of the group are properly equipped with waterproofs, good footwear, food/drinks, sun cream etc prior to visit.	1	4	4 (Low)	No additional action required
Inappropriate use of equipment causing injury	Young people in group	Leaders to instruct group members in the appropriate use of all field equipment.	1	2	2 (Low)	No additional action required
		Also see above.				
Activities causing contact with water and open cuts, resulting in contraction of Weil's disease	Young people in group, leaders	Teachers to be sent advisory information about Weil's disease.	1	4	4 (Low)	No additional action required
	Teachers and parent helpers	Leaders to instruct group members with open cuts to wear waterproof plasters.				
		Leaders to advise teachers with respect to use of plastic gloves – they must be completely water-tight otherwise they simply hold water around the cut.				
		Also see above.				
Thorns, rubbish, dog muck, sheep muck etc causing illness	Children in group, leaders	Teachers to be sent advisory information about toxocara, e-coli and tetanus.	2	2	4 (Low)	No additional action required
	Teachers and parent helpers	Leaders and teachers to look out for, and avoid, unsuitable locations for activities and lunch e.g. where there is sheep muck/litter.				
		Leaders to caution children about litter/dog muck at start of the day and remind them at appropriate points.				
		Leaders and teachers to encourage hand washing before lunch where possible. Teachers' information to suggest teachers bring baby wipes. Leaders to raise awareness of handling food with unwashed hands at lunch times.				
Uneven footpaths and muddy limestone tracks causing people to stumble/fall	Young people in group, leaders Teachers and parent helpers	Teachers to ensure all members of group are using appropriate footwear. Leader can choose to curtail visit if group are inadequately equipped.	4	2	8 (Med)	No additional action required



Example Risk Assessment – River Studies – continued

Hazard	Persons at Risk	Existing Preventative Measures	Probability	Severity	Rating	What/Who
Injury caused from contact with electric fence/ barbed wire fence	Young people in group, leaders Teachers and parent helpers	See above, with particular reference to tetanus.	2	3	6 (Med)	No additional action required
	Children in group, leaders	See above.	1	3	3 (Low)	No additional action required
(All walking is on pavements, in a car park on or footpaths)	Teachers and parent helpers					
Illness, such as e-coli, contracted from farm animals etc	Young people in group, leaders	Teachers to be sent advisory information about e-coli, etc.	1	3	3 (Low)	No additional action required
	Teachers and parent helpers	Leaders to instruct group members with open cuts to wear waterproof plasters and wash footwear after visit.				
		See above.				



Example Risk Assessment – Walking

LOCATION	Burbage Valley, Longshaw, Padley Gorge					
ACTIVITY	Moorland Discovery walk					
EQUIPMENT	Maps, ID charts, pencils, art pastels, earth walk equipment					
DATE OF ASSESSMENT	14/06/2006					
ASSESSOR	Peak District National Park Authority					
REVIEW DATE	14/06/2007					
Hazard	Persons at Risk	Existing Preventative Measures	Probability	Severity	Rating	What/Who
Inappropriate activities near and in water that lead to drowning	Young people in group, leaders	Leaders to provide good instruction and ensure excellent group management. Teachers to assist leaders and ensure excellent group discipline is maintained.	1	4	4 (Low)	No additional action required
	Teachers and parent helpers	Leaders trained in first aid, group leadership, hazard perception and carry first aid kits and emergency shelter. Leaders in contact with emergency services using mobile phone/radio.				
Death or serious injury caused by falling over steep rock face	Young people	See above.	1	4	4 (Low)	No additional action required
Getting lost on open moorland	Young people in group, leaders	Leader familiarisation with site.	1	1	1 (Low)	No additional action required
	Teachers and parent helpers	Leaders to carry map and compass, particularly in adverse weather conditions.				
Slippery banks, steep slopes, uneven footpaths, moorland groughs and rocks causing people to fall	Young people in group, leaders	Teachers to ensure all members of group are using appropriate footwear. Leader can choose to curtail visit if group are inadequately equipped.	6	1	6 (Med)	No additional action required
		Leaders to guide group through safest route and caution group of potential dangers.				
	Teachers and parent helpers	Teachers to assist leaders, ensuring that pupils use safest and most appropriate routes.				
Extreme weather conditions leading to hypothermia or heat exhaustion, or hypothermia caused by member of group falling into water	Young people in group, leaders	Teachers to ensure all members of the group are properly equipped with waterproofs, good footwear, food/drinks, sun cream, hats etc prior to visit.	1	4	4 (Low)	No additional action required
	Teachers and parent helpers	Leaders can choose to curtail the visit if group are inadequately equipped, or if weather conditions are likely to be unsafe.				



Example Risk Assessment – Walking – continued

Hazard	Persons at Risk	Existing Preventative Measures	Probability	Severity	Rating	What/Who
Inappropriate use of equipment causing injury	Young people in group	Leaders to instruct group members in the appropriate use of all field equipment.	1	2	2 (Low)	No additional action required
		Also see above.				
Ticks in bracken causing Lyme Disease	Young people in group, leaders	Teachers to be sent advisory information about Lyme Disease.	1	3	3 (Low)	No additional action required
	Teachers and parent helpers	Also see above.				
Thorns, rubbish, dog muck, sheep muck etc causing illness	Children in group, leaders	Teachers to be sent advisory information about toxocara, e-coli and tetanus.	2	2	4 (Low)	No additional action required
	Teachers and parent helpers	Leaders and teachers to look out for, and avoid, unsuitable locations for activities and lunch e.g. where there is sheep muck/litter.				
		Leaders to caution children about litter/dog muck at start of the day and remind them at appropriate points.				
		Leaders and teachers to encourage hand washing before lunch where possible. Teachers' information to suggest teachers bring baby wipes. Leaders to raise awareness of handling food with unwashed hands, especially at lunch times.				
Injury caused from contact with electric fence/ barbed wire fence	Young people in group, leaders Teachers and parent helpers	See above, with particular reference to tetanus.	2	3	6 (Med)	No additional action required
Traffic causing accident	Children in group, leaders	Leaders to provide good instruction and ensure excellent group management. Teachers to assist leaders and ensure excellent group discipline is maintained.	1	3	3 (Low)	No additional action required
(All walking is on pavements, in a car park or footpaths)	Teachers and parent helpers					
Illness, such as e-coli, contracted from farm animals	Young people in group, leaders	Teachers to be sent advisory information about e-coli etc.	1	3	3 (Low)	No additional action required
	Teachers and parent helpers	Leaders to instruct group members with open cuts to wear waterproof plasters and wash footwear after visit.				
		See above.				



The Moorland Visitor's Code

Heather covered moorlands look stunning, especially in August and September when in full purple bloom, and people are drawn to their great open landscapes. The 'Right of Access to Open Country' welcomes walkers to 'mountain, moor, registered common land, heath and down' – and with our rights, come responsibilities – naturally.

Britain has 75% of the world's remaining heather, and it is these heather moorlands that provide some of the last safe havens for ground nesting birds such as curlew, lapwing, merlin, golden plover and black grouse. As a result, the law protects most of these moorlands.

Our moorlands are there for us to enjoy, and by being informed and responsible visitors, we can all play our part in conserving our unique heather heritage and its wildlife for future generations.

Respect • Protect • Enjoy



Be safe – plan ahead and follow any signs

Even when going out locally, it's best to get the latest information about where and when you can go – especially if you are taking a dog (for example, your rights to enter some areas of open land may be restricted while work is carried out, for safety reasons or during breeding or shooting seasons). Follow advice and local signs, and be prepared for the unexpected. Get to know the signs and symbols used in the countryside to waymark paths and indicate open countryside.



Keep dogs under close control

The countryside is a great place to exercise dogs, but it's every owner's duty to make sure their dog is not a danger or nuisance to farm animals, wildlife or other people. Internationally important birds such as curlew, lapwing, red grouse, merlin, golden plover and black grouse rely on moorland to breed and are vulnerable because they nest and live on the ground. By law you must control your dog so that it does not disturb or scare farm animals or wildlife. You must keep your dog on a short lead on most areas of open country and common land in the nesting and lambing season – during March, April, May, June and July – and at all times near farm animals.



Prevent uncontrolled moorland fires

Smouldering cigarette ends, discarded bottles and dropped matches can all cause uncontrolled fires on moors – particularly during the spring and summer. Serious, deep-seated fires are fatal to important animals and plants and devastating to the landscape.



Protect plants and animals, and take your litter home

We have a responsibility to protect our countryside now and for future generations, so make sure you don't harm animals, birds, plants, or trees.



Leave gates and property as you find them

Please respect the working life of the countryside, as our actions can affect people's livelihoods, our heritage, and the safety and welfare of animals and ourselves.



Consider other people

Showing consideration and respect for other people makes the countryside a pleasant environment for everyone – at home, at work and at leisure. Moorlands managed for red grouse, farm stock and as water catchment areas, create year-round jobs for shepherds, water bailiffs, gamekeepers and moorland regeneration contractors – all of whom contribute to the conservation of moorland and its thriving wildlife.

For more information visit: www.countrysideaccess.gov.uk



Starting Off

It's important that your pupils have some wider understanding of the place they are in before they get on with investigations or tests. They need to understand that the moors are not a natural environment, but are managed by humans and have been over a long period of time. It's good if they can compare the place they are in with the place they are familiar with; start off by talking about something they know and are confident with.

Try to get the pupils involved with the landscape. It will help them make sense of the work you have planned to do with them, and also will hopefully help to give them a positive experience of the moors, which they will remember. We hope that positive memories will help to instil a sense of care of the moors for the future.

Here are some ideas for questions you could ask to try and engage your pupils with the unfamiliar place they are in.

Look around you

What do you see?

Listen

What can you see and hear that is different to where you live?

Sniff the air

How do you feel?

Why does the sky look so big? Why do you think there aren't any houses here? Or pavements? Are there many trees? Why not? Of the trees that you can see, how did they get here?

Why are there walls and where did people get the stone from to build them? Was the stone carried all the way up the hill? Or can you see signs in the hills around of hollows and holes in the ground?

How does the ground feel underfoot? What has the weather been like recently? Has this affected the ground you are standing on?

Feel the peat – pick some up and squeeze it. Jump up and down on it. Think of some interesting words to describe it.

How has this place become what it is today? What happened to the trees? What animals might you see here?

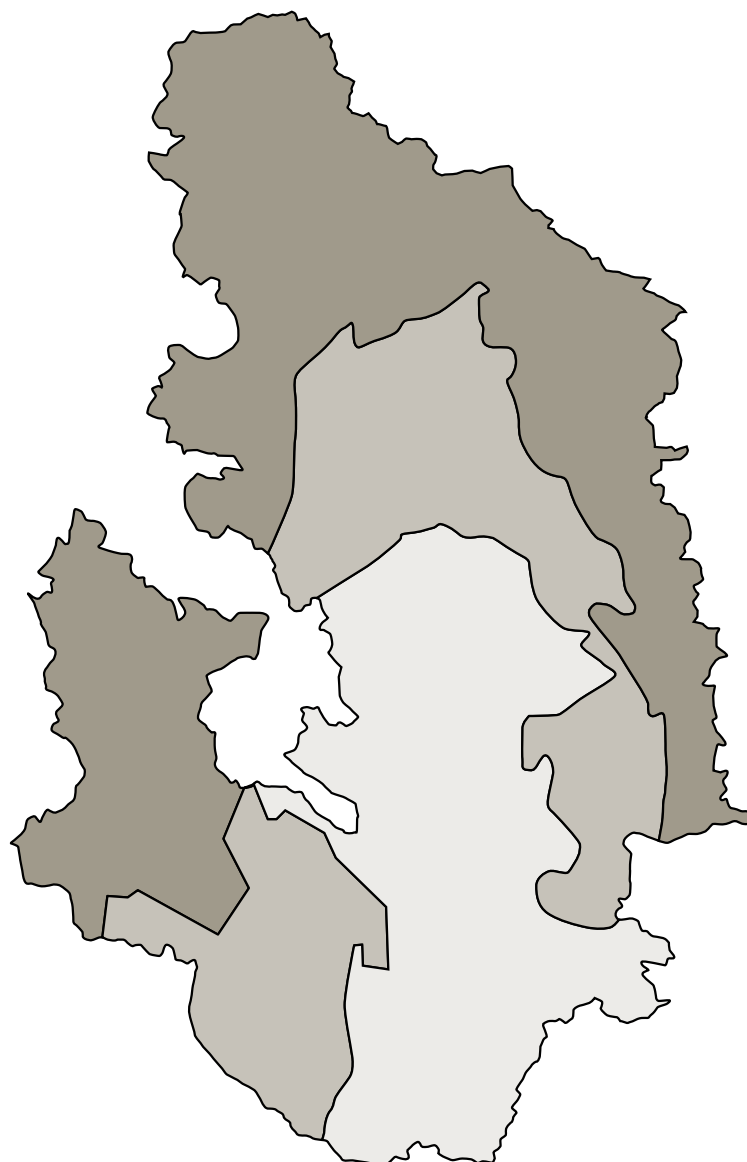
If you were a bird, where would you build your nest? If you wanted to hide up here, what colour clothing would you need to wear?






The Geology of the Peak District and its Moorland

The Peak District National Park landscape is strongly influenced by the rocks underneath the soil. The rocks, and the soils formed from them, partly determine which plants will grow on the land and, in turn, which insects and animals will live there. The rocks also affect people – where they live, the types of houses they live in and the jobs they do.

Most of the rocks that now form the surface of the Peak District National Park were laid down in the Carboniferous period of geological time.



-  Gritstone
-  Shale
-  Limestone

Rock Type

GRITSTONE

forming a horseshoe shape around the Park, forming the Dark Peak and South West Peak

SHALE

softer rocks, inter-layered and beneath the gritstone, which forms broad valleys across the Park

LIMESTONE

in the south and centre of the Park, forming the White Peak



The Geology of the Peak District and its Moorlands

Most of the rocks that now form the surface of the Peak District National Park were laid down in the Carboniferous period of geological time.

Geological Timescale		Number of years ago
	Recent	10,000
CENOZOIC	Pleistocene	1 million
	Quaternary	2 million
	Pliocene	10 million
	Miocene	25 million
TERTIARY	Oligocene	40 million
	Eocene	60 million
	Palaeocene	70 million
	Cretaceous	135 million
MESOZOIC	Jurassic	180 million
	Triassic	225 million
	Permian	270 million
	Carboniferous	350 million
PALAEOZOIC	Devonian	400 million
	Silurian	440 million
	Ordovician	500 million
	Cambrian	600 million
PRECAMBRIAN		4,500 million



Limestone

Limestone is the oldest rock of the Carboniferous period and was formed around 350 million years ago. At this time, Derbyshire was covered by a shallow tropical sea. What is now Britain was then quite close to the Equator. The bodies of dead shellfish, corals, sea lilies (crinoids) and other sea organisms gradually built up on the sea floor and fossilised over time to become limestone.



Palaeogeograph of the Peak District in Lower Carboniferous times

In the lagoons the water was shallow with little current. The limestone formed in the lagoons is almost pure calcium carbonate, very light coloured, with crinoids and brachiopod fossils.



The White Peak or Limestone Dale (Dovestones)

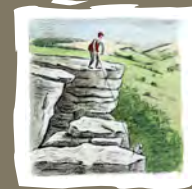


Crinoid fossils, locally known as Screwstones

Limestone has a great variety of uses. It is used as building stone; as aggregate (crushed stone) for roads or concrete; to improve agricultural land; to make cement (with shale) and (as burnt lime) in the chemical industry. The manufacture of a great number of materials uses limestone at one stage or another.

2 MOORLAND DISCOVERY

Geology



Gritstones and Shales

Around 325 to 300 million years ago, Derbyshire formed part of the huge delta of a river flowing down from what are now the Highlands of Scotland. Sediments of mud, sand and pebbles were deposited in the delta.

Fine grained mud and sand lying under the water formed a rock called shale. It is easily removed by erosion and so forms valleys such as the Hope Valley and the Edale Valley. Coarser sand and pebbles rose as sandbanks, which eventually became the sandstone known as millstone grit; so-called because millstones for grinding grain were made from it.

Over the years the delta advanced slowly southwards into the Carboniferous sea and their deposits were laid down in successive layers covering the limestone. The alternating layers of shale and sandstone seen in the face of Mam Tor are a result of sands cascading down the front of the delta (turbidites). Later layers of gritstone, such as the Kinder grit (forming Kinder Plateau) and the Chatsworth grit (found around Baslow and the Chatsworth Estate) were thicker and tougher.



Typical gritstone edge



Mam Tor landslide

The millstone grit outcrops in a horseshoe shape around the Peak District National Park and the sharp edges (scarps) of the outcrop can be seen around Curbar and Calver in the east, Edale in the north and the Roaches and Ramshaw Rocks in the west. Marine fossils can be found in the shale and sandstone layers, showing that the area was close to the edge of the sea.

For lots more information on the geology of the Peak District National Park and how we use gritstone visit: www.peakdistrict-nationalpark.info/place



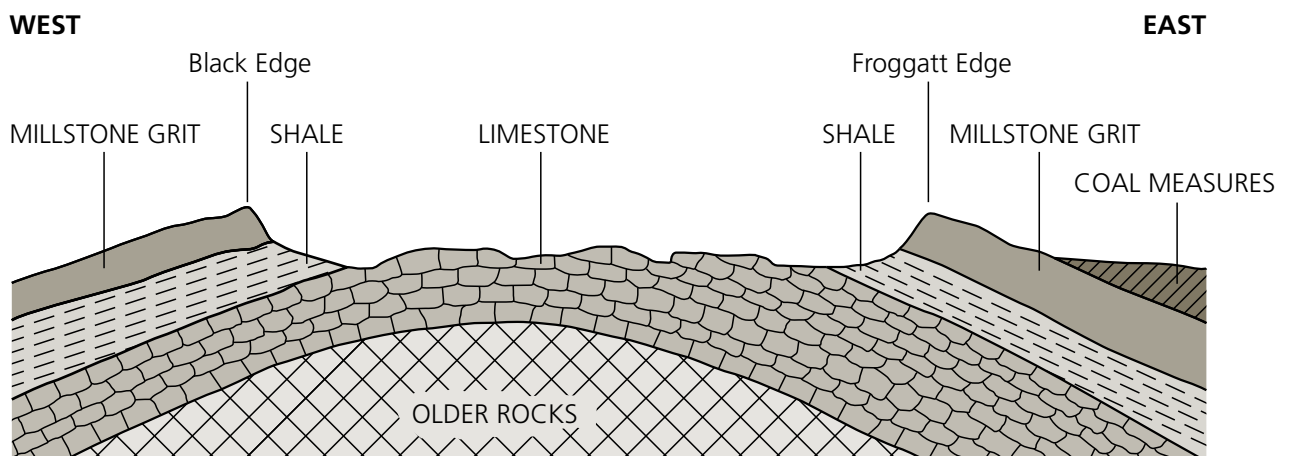
The Story of the Rocks

Uplifting, folding and wearing away

About 300 million years ago, the sea floor was lifted as a result of further movement within the earth. A gentle anticline (or upfold) was formed across what is now the Peak District. The land took on a dome-like shape. The folding caused faults (or cracks) to appear in the rocks – particularly in the limestone.

The rocks of the coal measures were eroded and gradually worn away. The gritstones were then exposed and also became eroded. At the most exposed part of the dome, the gritstone was completely removed to reveal the limestone underneath. This formed the southern part of the Peak District, known as the White Peak. The exposed gritstone edges can still be seen around the core of the dome, for example at Stanage Edge.

Where layers of gritstone and shale alternate and the shale is exposed to erosion, landslips can occur. The shale becomes softer and allows slippage between the harder layers of gritstone. These unstable rocks still cause landslips today such as the ones at Mam Tor and Alport Castles.



Cross-section showing profile of different rock types

Shaping the landscape of today

Erosion over many millions of years continued to remove the layers of younger rocks deposited over the uplifted land. It was the alternating warm and cold periods of at least four Ice Ages during the last two million years that finally gave the landscape the shape that we now see. Much of the land was frozen during this time. A layer of boulder clay was left in some areas (west of Bakewell); this was formed from the rocks and debris trapped under the ice of the glaciers in the early Ice Ages. Fast-flowing rivers fed by melting ice in the warm periods formed and deepened the valleys. As the rivers became deeper and wider the dales of the present landscape were carved out of the limestone. Some dales were formed, as caverns in the limestone collapsed. Only a few of the limestone dales now have streams because the water now flows underground. Cracks in the limestone widened into caves, as the land froze and thawed. In some places, limey water coming to the surface produce tufa, a honeycombed rock. In some places, a layer of fine sands and silt – called loess – was blown from the north on top of the limestone plateau.

The final layers of the younger rocks were carried away by erosion, leaving exposed the rocks of the Carboniferous period: gritstone, shale and limestone.

Points to consider

How do you think the geology of the Peak District has affected the landscape we see today?

2

MOORLAND DISCOVERY

Geology Activities



National Curriculum links

Science KS2 Rocks and Soils Unit 3D

Science KS3 Rocks and Weathering Unit 8G Rock Investigation

Activities

HEALTH AND SAFETY ACTIVITIES

ROCK INVESTIGATION

Health and Safety Activities

A variety of activities can be carried out on samples of rock or in the field when looking at rock faces. However care should be taken with rock faces, remembering that stones can be dislodged and fall. It is best to work far enough away to avoid injury.

It's very tempting for children to take samples of rocks, particularly fossils, home with them. Please try to ensure that pupils understand the significance of the rocks around them, how long it has taken for them to look the way they do and that they should stay where they belong. Please also ask the landowner if you particularly wish to take small samples of rocks for study purposes.

Rock Investigation

1. Look at the rocks in the landscape: look at a suitable rock face or boulders, and see if different layers can be recognised. Labelled sketches of the layers can be done. Are all the layers horizontal or are some at an angle? On gritstone, you will often see evidence of bedding at sharp angles as the sediment was laid down in a delta. Colour may be different on freshly broken samples.

2. Particle sizes: can the grains be seen with the naked eye? With a hand lens? Or are they smaller? Are there particles or crystals in the rock? Are there any fossils present? There may even be pebbles within a sample that can be measured. Gritstone is a type of sandstone so you should see obvious particles.

3. Rock rubbings: use thin paper and wax crayons. Produce rubbings on some of the boulders as a record of the rock type and the particle size. This is a good way of comparing different rocks in different locations without carrying samples with you. The rubbings can be linked to some of the other activities, as above, or used for collages and displays.

4. How does rock weather? Limestone rock is susceptible to acids in rain and soil. In the classroom try using strong vinegar on some rock samples, what happens? Some rocks which are softer and susceptible to acid rain weathering will start to fizz strongly. This is a good example of how rocks change shape because of the weather.

5. Rocks and Man: on your visit why not keep an eye out for how man has used the rocks? In the Peak District you may come across old quarries where the gritstone was removed to make large millstones, some of which have been abandoned where they were made. You could also look for stone walls, buildings, guide posts and many more examples.

3 MOORLAND DISCOVERY

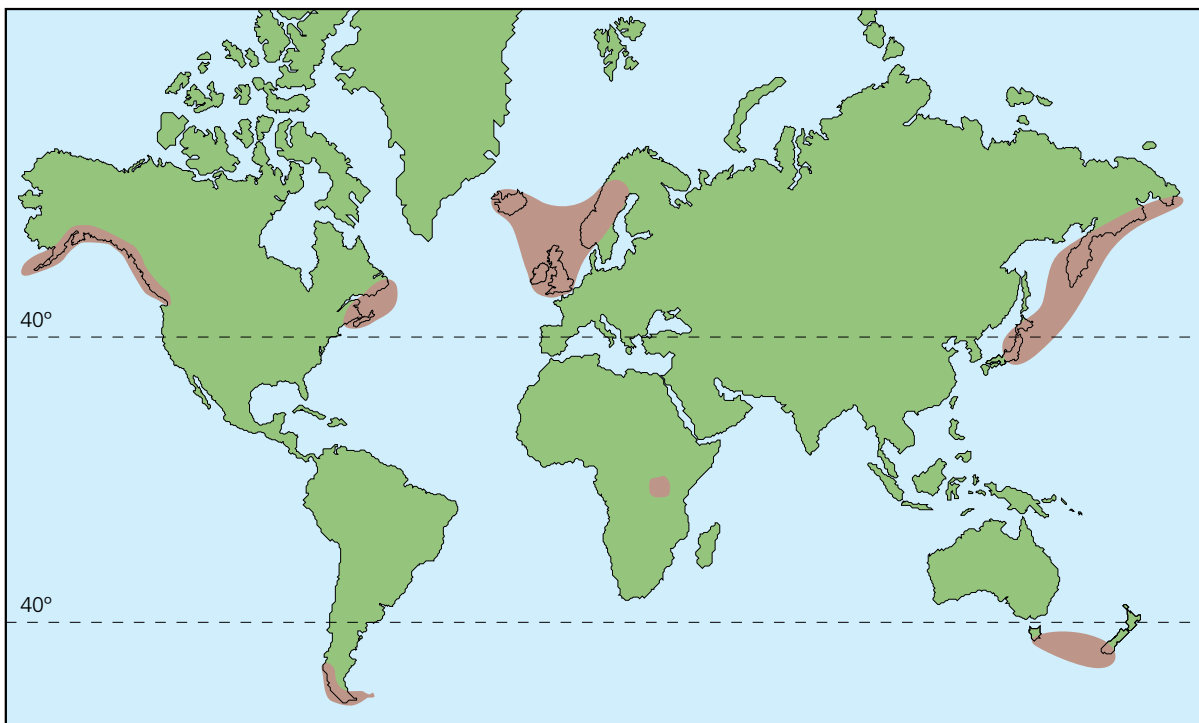
Peat



The Building Block of a Moorland

Peat is the name of the soil which makes the moorland such a special place. Peat is a rare soil, which started forming about 7500 years ago when the climate was cooler. Peat only forms in areas of the world which have high rainfall, poor drainage and cooler temperatures. In the British Isles we have around 10–15% of the world's peat habitat. On an international scale peat is a rarer habitat than tropical rain forest!

Map of the world showing areas of peat formation



How was peat formed?

Usually, when plants die they decompose and are consumed by worms, fungi and bacteria. However, where there is lots of rainfall, poor drainage and cooler temperatures, this process of decay can't take place properly because of a lack of oxygen. On moorlands the dead parts of plants only partially decay, and as they slowly accumulate, peat is formed. Peat can only be formed in anaerobic conditions; it is this lack of oxygen and high water level that maintains a healthy peat soil.

The most common plant which leads to peat growth is sphagnum moss, which is well adapted to bog conditions. Peat develops at less than 2mm per 100 years.

The peat in the Peak District National Park is the oldest in the British Isles as it started to form as the glaciers retreated.

In some places the peat has grown to a depth of over 3m; this is known as deep peat.

3 MOORLAND DISCOVERY

Peat



Changes Since the Last Ice Age

Age	Climate	Vegetation	Human Impact	Peat Formation
POST-GLACIAL 10,000 BC	Peri-glacial – glaciers melting, but still cold	Plateau – Artic tundra, pioneer tree species, eg willow, birch	None	None
BOREAL 7,600 BC	Warmer and drier	Light forest cover, mainly birch and pine. Plateau – rough grass and bilberry	Mesolithic – hunter gatherers lived on plateau	Light formation on plateau
ATLANTIC 5,500 BC	Warmer and wetter	Mixed deciduous forest up to 2,500ft, thinner on plateau and bog species found	Began tree felling in earnest	Increasing on plateau
SUB-BOREAL 3,000 BC	Drier but still warm	Elm decline. Wet bog species replaced by drier heath species	Neolithic – start of agriculture. Slash and burn forest to clear the land	Formation of peat slowed down
SUB-ATLANTIC 600 BC	Cooler and wetter	Agriculture failed due to soil acidity. Forest failed to regenerate, heather moorland developed	Bronze Age – greater deforestation. Iron Age man and Romans managed moors	Increase in peat formation
PRESENT DAY	Warmer	Few trees, open heather moorland and rough grassland	Modern man – overgrazing, pollution, management by burning	Peat formation stopped

3 MOORLAND DISCOVERY

Peat



The Building Block of Moorland – continued

Preserver

The damp, cool and acidic conditions of peat bogs can be very effective preservers.

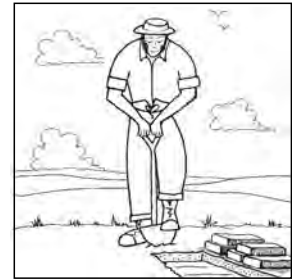
Parts of prehistoric trees have sometimes been found in amongst the peat, called bog oak. In Cheshire the body of an Iron Age man was discovered, perfectly preserved in the deep peat of Lindow Bog, near Wilmslow. He's known as Lindow Man or Pete Marsh and he's about 2,000 years old.

Peat is a valuable resource for archaeological research because it is such a good preserver, and records the plant and animal life that has lived on the moors for the last 10,000 years.

Fuel

During the Medieval period people used to cut peat from the moors, which was then burnt and used as fuel. Small pieces of turf were cut out of the moorland. These were then put out in the sun to dry out.

The peat cutters used to move the piles of peat on sleds down the hillsides, making trackways which you can still see today. People have cut moorland peat for fuel throughout the British Isles, and in some parts of Scotland and Ireland they still do.



Peat in decline

Peat is under threat for many different reasons, which have contributed to a decline in the health of many moorland habitats and the loss of many moorland species.

- *Acid rain*

After the Industrial Revolution the increase in acid rain had a massive effect on the health of the peat bogs. Although peat is an acid soil and the plants on the peat bogs are adapted for this environment, many of the mosses can't cope with the increasingly acid rain. During this period many species of moss were lost.

- *Sheep*

Over-grazing by sheep destroys the vegetation and can allow grasses to become dominant.

- *Accidental fires*

Fire destroys the protective cover of vegetation and during hot fires the peat itself can catch fire. This means that the exposed peat can be eroded, as the vegetation finds it difficult to re-colonize these burnt areas.

- *Visitors*

Visitors to the moorland habitats can cause erosion by wearing away vegetation through trampling; this allows the peat to wash away.

- *Gardening*

One of the worst threats to peat has been through the excavation of peat by companies for use as potting compost for garden centres.

All these processes result in the peat becoming exposed. If the peat dries out it starts decomposing, which means the particles within the soil get smaller (or the soil oxidises). As a result of this the peat is easily eroded, getting washed away when it rains, or blowing away in high moorland winds.

3 MOORLAND DISCOVERY

Peat



The Building Block of Moorland – continued

Climate change

It is thought that as the country gets warmer and drier in the future the effects on our moorland will be dramatic. The potential for increased numbers of wildfires would rise, along with the rate of peat erosion through increased oxidation.



Bleaklow plateau

Peat as a 'Carbon Sink'

Peat, and especially deep peat and blanket bogs, are environmentally important as they act as a 'carbon sink'. Naturally, when plants rot away, they release the carbon they contain back into the soil and air. However in a peat bog, because of the waterlogged, airless, acidic conditions, the dead plant material doesn't rot away but is stored. This means that the carbon held within the plant material is stored within the peat for the life of the soil; this is a 'carbon sink'.

If peat is kept healthy and with a good cover of plants, the carbon uptake is greater than the amount of carbon released; this process is called 'carbon sequestration'.

However if peat is damaged, or becomes inactive through bad management, fires and climate change, the carbon is released from the soil. This is caused when decomposition within the soil is greater than the rate of plant material being added. The release of the carbon held within peat bogs may have an impact on global warming.

It is thought that peat bogs within the UK store more carbon than all the forests in UK and France combined. (Martin Evens – Manchester University).

3 MOORLAND DISCOVERY

Peat Activities



National Curriculum links

Science KS2 Rocks and Soils Unit 3D

Science KS3 Environmental Chemistry Unit 9G

Activities

FIELD STUDIES RECORD SHEET

SOILS – FIELD EXPERIMENT RECORD SHEET

DIRTY HANDS TEST

Important: *handling soil should be done with care; you will need to wash your hands carefully, or choose to use disposable gloves when handling soil.*

Soil types vary from one part of the country to another, from field to field, and on different rock and vegetation types.

You could collect soils of different colours, or beneath different plants, or where land use is different. If you take small samples of peat and compare its properties with other soils, you may begin to understand why there is so much variation in the landscape. Collect small, golf ball-sized samples to work with. If you are taking the soil back to school you will need small plastic bags, which can be sealed and labelled, so you know which can be sealed and labelled, so you know which soil is which.

Field Studies

FIELD STUDIES RECORD SHEET

- Complete a field study journal for the sites where you collected the soil. You can make this quite detailed if you wish. (Some of the information you may need to look up back at school).
- Describe the exact site by giving a grid reference and explaining its layout. You could say whether it's flat, steeply or gently sloping, which way the slope faces (whether it is sunny or in shade), the types of plants/or land use. If the rocks are visible, attempt to identify the main rock type or look up the rock type later. It would also be a good idea to describe the weather at the time of the study, as some of the soil properties will vary depending upon how wet it has been. Complete a row for each soil type/site you have visited.

Soil Field Experiments

SOILS – FIELD EXPERIMENT RECORD SHEET

1. Compaction: Measure how trampled the soil is at different points across a path. Start on one side, well into the vegetation, and, at even intervals, take five measurements across the path. Alternatively, you could compare one soil type or land use with another. To do this, use an ordinary pencil. Push the pencil firmly into the soil, without banging it in or using your foot. Measure how far it penetrates. Carefully mark the soil level on the pencil, pull it out and using a ruler, measure the distance. You would expect to get different results from wet and dry sites. If you wish, you could do this three to five times at each location in order to get an average.

2. Percolation: This is a measure of how quickly water soaks into the soil. A very simple way of testing this is to pour the same amount of water onto the ground at each test site and to time how long it takes to disappear completely. To save carrying water, you could use the nearby streams. Water may not soak in for a number of reasons: the soil may be very dry and compacted; it may already be saturated; the slope is too steep and water just runs off.

3 MOORLAND DISCOVERY

Peat Activities



2. Percolation (continued)

A more technical version involves using an old tin can, with both ends removed. The can is hammered into the soil to a depth of about 3cm and then water added to the can in the same way as before – a known volume of water, timed until it disappears. This method stops water just running down a slope, but requires more preparation beforehand.

3. Moisture content: Take a roughly equal amount of soil from each site and squeeze it hard. Record how much water comes out – none, a little or a lot. The soil can be described as dry, moist or wet.

4. Smear test: An easy one. Can be used to show the true colour of the soil, which is a good indicator of soil type. Needs only clean white paper and a little moisture. Use your thumb to spread a thin smear of soil across the paper. Any loose excess should be brushed off. You will be amazed how different the colours can be – anything from yellow, to orange, browns and even black. Soils can even vary with depth.

5. Mud test: This is one for back at school. Put a small handful of soil in a clean container with a lid (if comparing different soils). Fill with water and secure the top, then shake vigorously. Leave the mixture to stand for at least 24 hours. Next day, see what has happened. This could be just a simple comparison, or the different layers seen could be described and measured for their thickness. Comparing each layer to the total thickness would enable students to work out the percentage of soil in each layer. Also note whether the liquid on top is clear or coloured. Finally, look for any obvious features like stones on the bottom or bits floating on the top. Compare any differences looking at rock type or vegetation type.

6. Dirty hands test: This can be done in the field or back at school. In each case use a small golf ball-sized lump of soil. Make sure your sample is moist rather than really wet. Firstly, rub a very small pinch of soil, rub it between your fingers. Decide whether it feels sticky, smooth or gritty. Now use a larger sample of soil, moisten it enough so it sticks together in a lump and use the **flow chart** to see what type of soil you have. (Warn about over-wetting the soil; you can easily add a drip or two more moisture, but it's harder to remove it). There are two versions, one simpler and hence more suitable for younger children. You will need water for the test, though water from a local stream or even puddle is suitable. The further the test goes the more clay is present. In school you may want to give students a sample of pure clay for comparison.

DIRTY HANDS TEST

Carry out this simple test to find out what type of soil it is:

1. Add enough water to the soil sample so that you can knead it for a few moments in your hand.
2. Try to make the following shapes. The shape will tell you what the soil type is likely to be.

Shape/type of soil	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Cone – sand					
Ball – sandy loam					
Worm – loam					
Bent, cracked worm – clayey loam					
Smooth, bent worm – clay					

The final shape you get is the soil texture, e.g. if a worm shape can be made, but it breaks if bent, then it is a loam.

Source: Soil Association

3

MOORLAND DISCOVERY

Peat Activities



Field Studies Record Sheet

Name _____ Location _____ Date _____

Record the site reference and description

Site description	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Grid reference					
Site location from OS map					
Slope					
Flat/gentle slope/steep slope					
Position on slope					
Top/middle/bottom					
Direction slope faces					
North/south/east/west					
Aspect of slope					
Sunny/shady					
Main plant type					
Moorland/grassland/woodland					
Land use					
Farming/grouse moor/woodland					
Main rock type					
Gritstone/shale/limestone					
Weather					
Sunny/cloudy/windy/rain/frost					

3

MOORLAND DISCOVERY

Peat Activities



Soils – Field Experiment Record Sheet

Name _____ Location _____ Date _____

Record your results for each of the field experiments

Field experiment	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Compaction					
Pencil depth in centimetres					
Percolation					
Time it takes for water to soak away in seconds					
Moisture content					
Wet/moist/dry					
Smear test					
Soil colour					
Dirty hands test					
Soil type – sand/sandy loam/ loam/clayey loam/clay					
Main plant type					
Moorland/grassland/woodland					

3 MOORLAND DISCOVERY

Peat Activities



Dirty Hands Test

Carry out this simple test to find out what type of soil it is:

1. Add enough water to the soil sample so that you can knead it for a few moments in your hand.
2. Try to make the following shapes. The shape will tell you what the soil type is likely to be.

Work through these stages; try all the stages before working out which soil type you have. You may need to wet the soil a little between stages. Take care not to over-wet the soil.



Source: adapted from Peak National Park Education Service

4 MOORLAND DISCOVERY

Ecology



A Mosaic of Habitats

Many people, when they look at our moorlands, see areas of barren open land spreading far into the distance. In fact, if you get a little closer, our upland areas are made up of many different, very special plants and animals. These areas are a mosaic of different habitats which, together, make up the moorlands as we see them today. Our moorlands are a semi-natural environment, which means, over thousands of years up to the present day, humans have influenced these areas. Although the moorlands look like a wild and untouched place, they are actually a semi-natural managed landscape.

Over such a long period of time the plants and animals that make up this habitat have become highly specialised and some are unique to these areas. Because of the way moorland habitats have developed, this has meant that they only exist in very few places in the world.

Within the UK we are very lucky, as we have 75% of the world's heather moorland. These internationally-rare habitats support many scarce and significant populations of birds, mammals, insects and plants. The ecology of our upland areas can be very complex and difficult to understand, but it is important that we appreciate the significance of this wonderful environment.



Map of Europe showing areas where heather moorland is present

4 MOORLAND DISCOVERY

Ecology



What is a Moorland?

A moorland is classified as an area of open land, usually with acid, peaty soils dominated by dwarf shrubs and mosses. The area dominated by moorland is in a band which falls below the mountain limits and above agricultural land. This generally means that moorland starts at altitudes of more than 250m (below this, areas of heather are classified as a lowland heath). It forms on high plateaux and hillsides with more than 1,000mm of rainfall per year. These areas are generally very exposed and, as a result, are cold and windy. These conditions make it very difficult for plants to get a foothold, so the plants that thrive on the moors are generally very special and highly adapted for these extreme conditions.



Moorland character High open countryside
Upland farming, unimproved
High rainfall
Semi-natural habitat

4 MOORLAND DISCOVERY

Ecology



What are the Different Types of Moorland?

Within the UK there are 71 different types of moorland habitat described by the National Vegetation Classification (NVC). Of these, 22 are present in the Peak District National Park moorland areas. These habitats range from dry heath or heather moorland to blanket bog. There are many different classifications within these two. Moorland habitats vary depending on the depth of the peat, the slope of the land and how waterlogged the soil is. This affects the biodiversity of the area. Below are some of the main habitat types.

Heather Moorland

Heather moorland is the most common type of moorland, currently covering approximately 0.4 million acres of upland England. The vegetation is dominated by heather (*Calluna vulgaris*) and is found on gentler, relatively dry slopes.



Special species

Birds

Red grouse
Merlin
Short-eared owl
Hen harrier

Mammals

Mountain hare
Pygmy shrew

Other

Common lizard
Heather bumble bee
Adder
Green hairstreak butterfly

Impacts on this habitat

Past management which has reduced the species diversity, over-grazing with sheep, accidental fires, pollution, drainage, recreational disturbance to breeding birds and increased erosion.

4 MOORLAND DISCOVERY

Ecology



Cottongrass Moorland

Cottongrass moorland is a rare vegetation type occurring in wet areas where the peat is generally of a depth greater than 70cm. Roots are therefore unable to reach the richer mineral soil below the peat. The roots of the cottongrass form a mat which helps bind the surface of the peat together. This helps to reduce erosion of the peat. Because of this cottongrass has been used in restoration projects to help retain eroding peat on the tops of the moors.



Special species

Birds

Reed bunting
Curlew
Lapwing
Snipe

Insects

Many rare insects are associated with these areas including:

three moths, four flies, two weevils and nine beetles

Impacts on this habitat

Drainage which lowers the water table and dries out the peat, poor management, lack of knowledge.

4 MOORLAND DISCOVERY

Ecology



Blanket Bog

Blanket bog or sphagnum bog occurs in very wet areas with low temperatures and where the peat layer forms relatively quickly. This area consists predominantly of sphagnum mosses. Between 10-15% of the world's blanket bog is found in the UK. There has been a reduction in the number of sphagnum species from 18 in 1901 to just one widespread and three rare species today.



Special species

Birds

Golden plover
Dunlin
Redshank
Teal

Plants

Cloudberry
Labrador-tea
Sphagnum moss

Impacts on this habitat

Drainage which lowers the water table and dries out the peat, de-vegetation and erosion through recreation, pollution and especially acid rain, high grazing pressures, accidental burning and disturbance of breeding birds.

4 MOORLAND DISCOVERY

Ecology



Grass Moorland

Grass moorland generally consists of rough, unpalatable species and tends to be dominated by mat grass (*Nardus stricta*) and purple moor grass (*Molinia coerulea*). The peat is generally less than 20cm deep, so the grass roots can't reach the mineral soil below. This type of moorland is found in wetter areas.



Special species

Birds

Curlew
Twite
Whinchat

Ring ouzel
Skylark

Impacts on this habitat

Agricultural impacts such as liming, fertilizer application, muck spreading, over-grazing, invasion of bracken.

4 MOORLAND DISCOVERY

Ecology



Moorland Succession

What is succession?

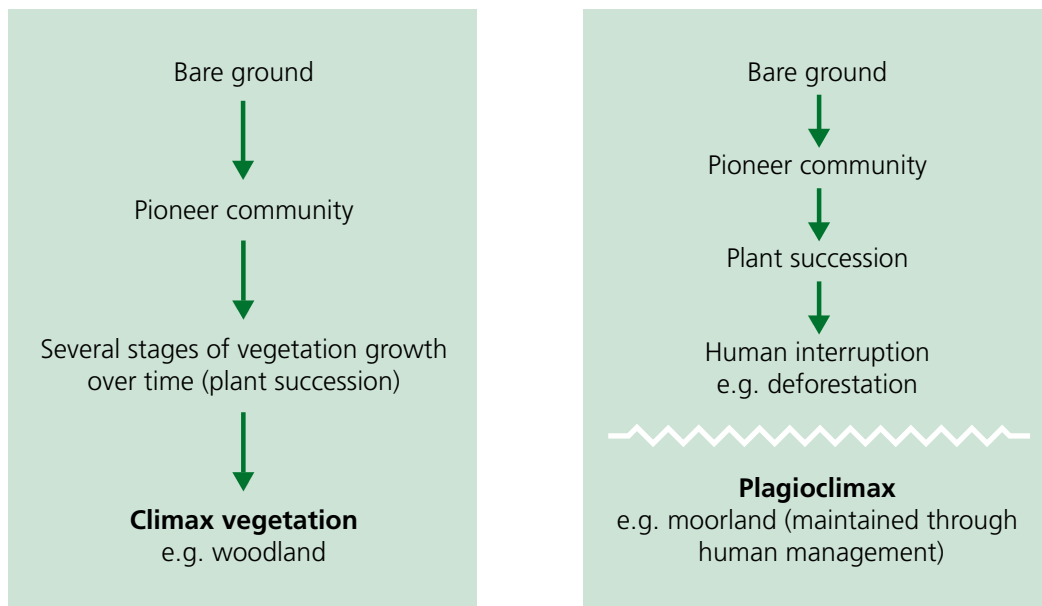
This is the process of plant colonisation which happens in predictable stages. First, areas of barren land are colonized by little plants such as moss, and later, grasses; these are called pioneer communities. Slowly, over time, the barren land is covered by these pioneers, and the soil becomes stable and healthy. This allows bigger plants such as shrubs to take root. Over time, this process of succession reaches a mature and stable environment such as a forest – this is known as a climax community.

In the past, it is thought that there were five distinct climax vegetations in the British Isles: deciduous woodland, northern pine forest, blanket bog, heath and arctic-alpine.

Few, if any, deciduous woodlands or northern pine forests have survived completely unchanged, whereas there are areas of blanket bog, heath and small packets of arctic-alpine climax vegetation which have survived, including some still in the Peak District.

Most of the moorlands however are not a climax community; they have been altered over many years by human and natural influences. These human and natural activities have altered the natural succession and the resulting vegetation is maintained through management. The moorlands are an example of a plagioclimax; this is where the natural succession to a climax community has been interrupted, and then, through human and environmental factors, this is maintained. Although areas of blanket bog are a natural climax community, the areas of heather and grass moorland are a plagioclimax community. These plagioclimax communities are maintained through moorland management, such as burning and sheep farming.

Succession example



4 MOORLAND DISCOVERY

Ecology



Special Plants

Watson's heather lifecycle

Link: [heather lifecycle](#)

The heather lifecycle is an example of how a plagioclimax is maintained by management. Heather (*Calluna vulgaris*) is a long-lived shrub and can live up to 40 years. It is managed by gamekeepers to provide food and shelter for grouse. The lifecycle of heather can be split up into four main phases. If the heather is allowed to complete its lifecycle it would eventually over time provide cover for young tree saplings to take hold. However, due to management, this lifecycle is interrupted, the plagioclimax is maintained and a true climax community is never reached.

Adaptation

Moorlands are difficult environments for plants to survive in. The combination of wind, high rainfall, acid soils, cold climate and periods of extreme waterlogging and extreme drought provide some of the most testing conditions for both animals and plants. Many of the moorland plants have become very specialised and highly adapted to the adverse climate.

Plant	Adaptation	Condition
Cottongrass	Have sunken stoma and a hollow stem, which conducts oxygen to the roots.	Waterlogged soils lead to poor soil aeration.
Heather	Dwarf shrub with very small leaves held close to the stem to prevent water loss.	Strong winds cause desiccation and increased transpiration.
Bilberry	Is a deciduous shrub, this reduces water loss during the winter, but its green stem allows for photosynthesis during warmer winter spells.	Soils may be frozen during cold winters, which prevents water uptake by the plants.
Cowberry	Has small waxy leaves with sunken stoma.	To prevent water loss in high winds

4 MOORLAND DISCOVERY

Ecology



Heather Lifecycle



0–6 years

Pioneer phase

Provides good food for the grouse, but heather is only young so provides low cover and poor structure.



6–15 years

Building phase

This phase provides the highest production of young shoots – most food for grouse. It also provides good cover for different animals.

Regeneration

Young heather shoots start to establish in the gaps.

Heather is burnt

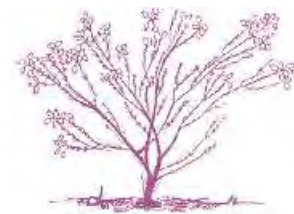
when it is starting to provide less food and cover for the grouse.



30+ years

Senescent/degenerate phase

Heather starts to collapse which provides less cover. Other species become more dominant. Heather at this stage is of poor food value.



15–30 years

Mature heather

Provides good deep cover for breeding birds. Other species of plants start to invade. Heather provides less food value.

4 MOORLAND DISCOVERY

Ecology Activities



National Curriculum links

This section has activities for KS1, KS2, KS3 and KS4

Activities

HEATHER LIFECYCLE (WORKSHEET 1)

HEATHER LIFECYCLE (WORKSHEET 2)

MOORLAND PLANTS ID CHART

MOORLAND BIRDS ID CHART

BURNT AREA INVESTIGATION RECORD SHEET

TRAMPLING INVESTIGATION RECORD SHEET

DOUBLE BUBBLE

DESIGN A MAMMAL

MOORLAND ECOLOGY ACTIVITIES

BIRD FACT FILE

MOORLAND FOOD CHAIN MOBILE (WORKSHEET 1)

MOORLAND FOOD CHAIN MOBILE (WORKSHEET 2)

MOORLAND ANIMAL MASKS

ANIMAL MOVEMENT GAME

Moorland investigations

There are a number of investigations which you can carry out to investigate the moorland ecology.

Two investigations are described on the **next page**. Visit the site prior to your visit to make sure you are visiting good examples of the habitat you wish to study.

4 MOORLAND DISCOVERY

Ecology Activities



Burnt area investigation

- An efficient way to study the management and structure of the moorland is to look at different aged heather burns.
- Look through the heather **lifecycle sheets**. There is also a quiz which would be a good follow-up lesson, for the quiz visit www.moorsforthefuture.org.uk
- To compare the different ages of burnt heather each group will need a quadrat, a tape measure, a vegetation survey sheet and a **plant ID chart**.
- The group should be divided into teams and then spread out over the first burn site. You should have at least three sites with different aged heather, including a new burn site.
- Each group should take three random vegetation samples within each burn area. A simple way of placing your quadrat randomly for the investigation is to throw the quadrat over your shoulder. Pupils then record the % cover of each species within the quadrat.
- Then record the height of the longest piece of vegetation.
- Repeat the process for each burn area. This will give the group a good number of results which can be analysed using the results spreadsheet.
- Remember, advise the group not to throw the quadrat too far and be aware of others around them.

Outcome: pupils will discover how controlled burning of heather affects the range of plants growing on the moor, and will consolidate their understanding of heather management.

Trampling investigation

- This is a good investigation to study how recreation affects the moorland habitat. You may wish to read the moorland recreation and tourism fact sheet.
- To investigate the effects of trampling of the vegetation each group will need a long tape measure, a **vegetation survey sheet** and a **plant ID chart**.
- The tape measure should be placed horizontally across the path, running 20m off into the vegetation
- Each group should take a series of readings along the length of the tape measure. This is indicated on the vegetation survey sheet.
- At each point the group should place a ruler or point quadrat down into the vegetation at the correct measurement on the tape.
- They should then make a record of the species touching the ruler or point quadrat. They should also record the height of the highest piece of vegetation touching the ruler.
- This should be repeated along the length of the tape measure. This will give the group a good number of results which can be analysed using the results spreadsheet.

Outcome: pupils will have a series of results which they can use to work out how well different plants are able to grow closer to and further away from the footpath, and whether regular trampling or walking over plants affects their growth. This investigation will also help pupils to notice how well-used a footpath is and whether users have strayed from the footpath and over vegetation.

4 MOORLAND DISCOVERY Ecology Activities



Heather Lifecycle

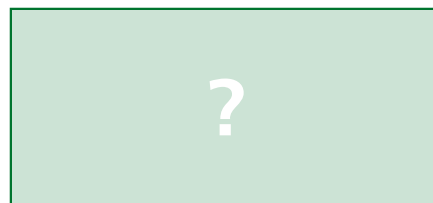
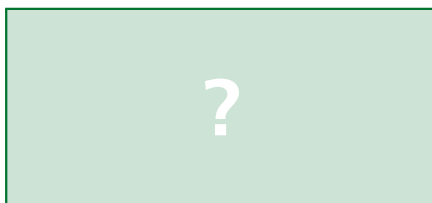
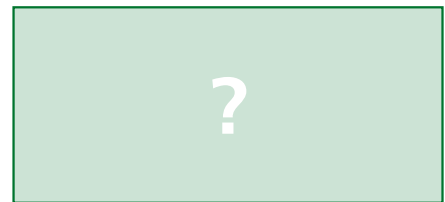
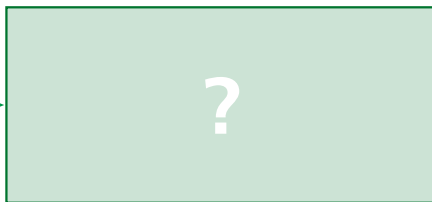
Worksheet 1 – put in the answers on Worksheet 2. Check your answers on page 41.



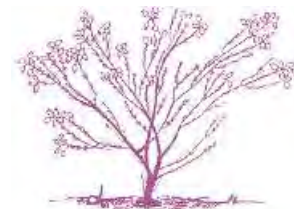
0–6 years



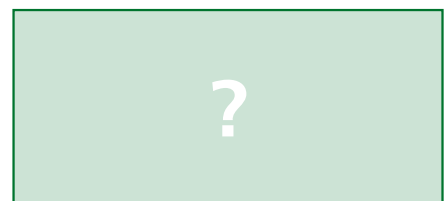
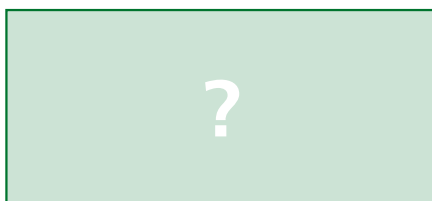
6–15 years



30+ years



15–30 years



4 MOORLAND DISCOVERY

Ecology Activities



Heather Lifecycle

Worksheet 2

Can you complete the heather lifecycle by matching the correct description to the correct stage of heather growth?

Senescent/degenerate phase

Heather starts to collapse which provides less cover. Other species become more dominant. Heather at this stage is of poor food value.

Regeneration

Young heather shoots start to establish in the gaps.

Building phase

This phase provides the highest production of young shoots – most food for grouse. It also provides good cover for different animals.

Pioneer phase

Provides good food for the grouse, but heather is only young so provides low cover and poor structure.

Mature heather

Provides good deep cover for breeding birds. Other species of plants start to invade. Heather provides less food value.

Can you find the right place for this statement?

Heather is burnt

When it is starting to provide less food and cover for the grouse.

4 MOORLAND DISCOVERY Ecology Activities



Moorland Plants ID Chart



Cowberry
Vaccinium vitis-idaea



Cloudberry
Rubus chamaemorus



Crowberry
Empetrum nigrum



Bilberry
Vaccinium myrtillus



Sphagnum moss



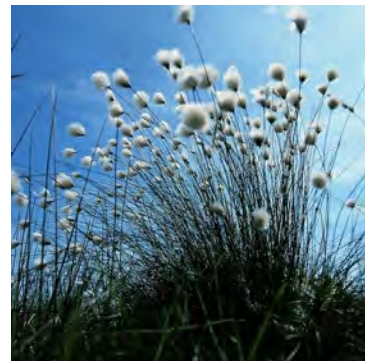
Star moss



Heath bedstraw
Galium saxatile



Common cottongrass
Eriophorum angustifolium



Hare's-tail cottongrass
Eriophorum vaginatum



Bell heather
Erica cinerea



Heather (Ling)
Calluna vulgaris



Cross-leaved heather
Erica tetralix

4 MOORLAND DISCOVERY Ecology Activities



Moorland Birds ID Chart



Curlew
Numenius arquata



Skylark
Alauda arvensis



Dunlin
Calidris alpina



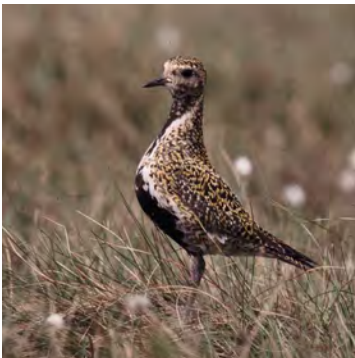
Red grouse
Lagopus lagopus



Meadow pipit
Anthus pratensis



Merlin
Falco columbarius



Golden plover
Pluvialis apricaria



Short-eared owl
Asio flammeus



Hen harrier
Circus cyaneus



Lapwing
Vanellus vanellus



Snipe
Gallinago gallinago



Ring ouzel
Turdus torquatus

4 MOORLAND DISCOVERY

Ecology Activities



Burnt Area Investigation Record Sheet

Name _____ Location _____ Date _____

Select three different areas of heather. Throw a quadrat over your shoulder and estimate the percentage cover within the quadrat of the following:

Plant	Burnt heather (0–6 years)	New growth (6–15 years)	Mature heather (15–30 years)
Heather			
Bilberry			
Crowberry			
Sedges (cottongrass)			
Narrow-leaved grass			
Broad-leaved grass			
Rushes			
Mosses			
Other plants			
Bare ground			
Animal signs			

4 MOORLAND DISCOVERY

Ecology Activities



Trampling Investigation Record Sheet

Name _____ Location _____ Date _____

Measuring at a right angle from the side of a footpath into the vegetation, using a long tape measure and at the following intervals check for the plants listed below. (You could use a point quadrat for this investigation.)

Plant	0cm	10cm	20cm	40cm	60cm	1m	1.5m	2m	3m	4m	5m	7m	10m	15m	20m
Heather															
Bilberry															
Crowberry															
Sedges (cottongrass)															
Narrow-leaved grass															
Broad-leaved grass															
Rushes															
Mosses															
Other plants															
Bare ground															
Animal signs															

4 MOORLAND DISCOVERY Ecology Activities

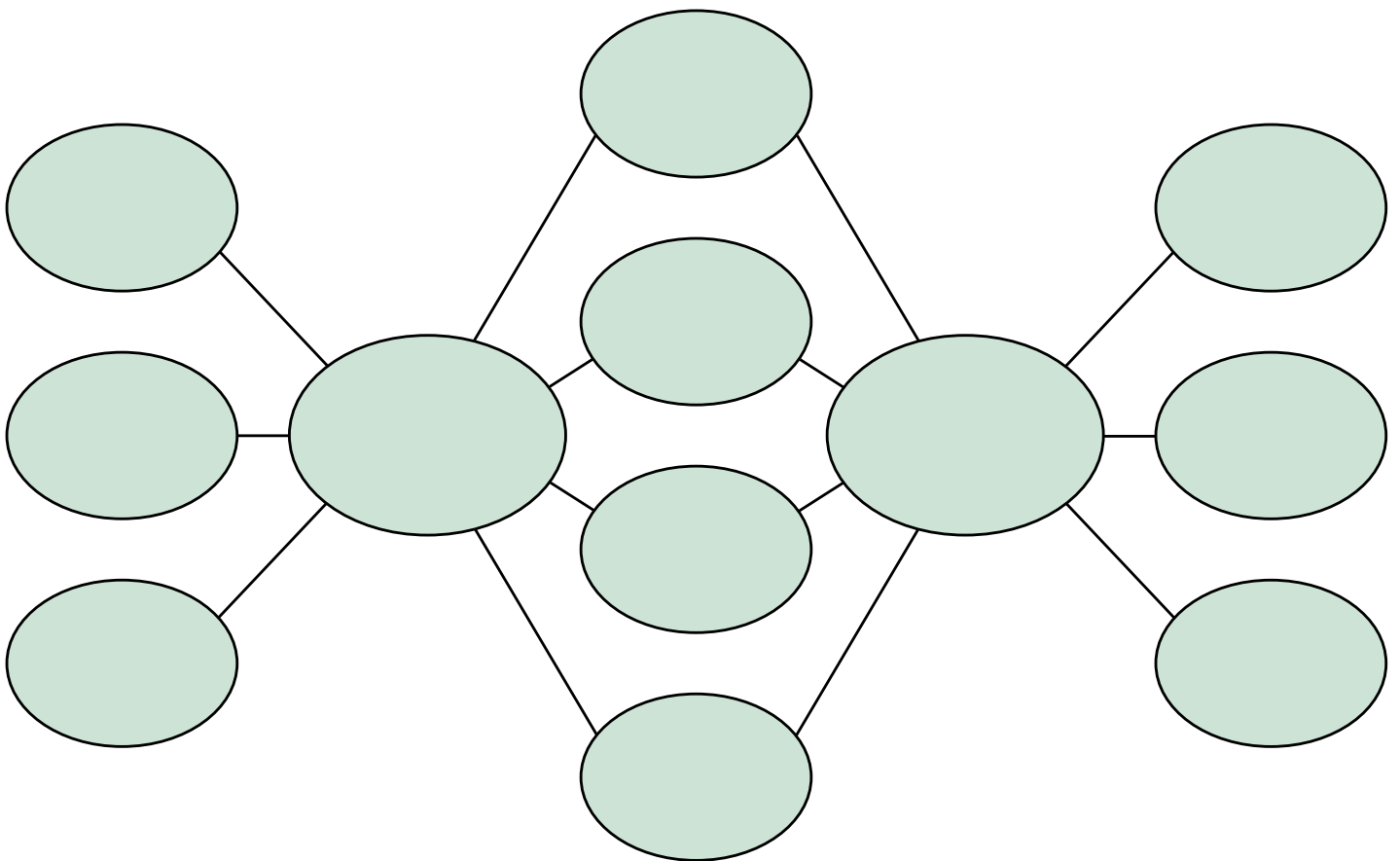


Double Bubble

Thinking skills

These activities can be done indoors or outside. Use paper or get the children to stand in the correct places. Compare and contrast. This is a bit like a Venn diagram.

1. Inside the two big central bubbles, write the names of two moorland plants, habitats or creatures.
2. Inside each of the four small middle bubbles, write something that they have in common.
3. Inside each of the three outer bubbles on either side, write something that is different about each of them.



4 MOORLAND DISCOVERY

Ecology Activities



Design a Mammal

This will help to consolidate understanding of adaptation.

1. Split the pupils into groups of three or four.
2. Design a creature to live on the moors.
3. Pick six characteristics from the list below;
4. Justify your choices, give the animal a name and make a big annotated drawing of it.

Characteristics			
Thick furry coat	Night sight	Eats plants	Coat changes colour
Can fly	Loud call	Eats live prey	Webbed feet
Sharp claws	Long thin bill	Long legs	Long back feet
Big ears	Bright green feathers	Brown coat	Sharp hooked beak

Add some more possible, or completely whacky, characteristics to the list.

Moorland Ecology Activities

Using the bird fact file (page 52)

- Use the internet to research other moorland birds and create your own fact file.
- Create cards to represent each bird or animal – play card games such as snap or pairs.
- Make odd-one-out sheets of plants, birds or moorland wildlife. Include an image of a parrot, or a rose, or a tiger, for example.
- Group cards according to family groups, food, migration.
- Make your own 'Moorland Bird Symphony'. Each pupil chooses a moorland bird call to practise. Form a circle, the teacher or conductor stands in the centre and points to each pupil in turn to make their bird call. The group can then be directed to make their calls together or could be organised in 'flocks' and directed to make their calls in turn.

Using the background information about the moorland habitats create different moorland habitat paintings; draw, cut out and stick on the appropriate animals and birds. To consolidate the learning about habitats, flaps could be added or cut into the painting, and animals stuck underneath, on their nests or in their burrows.

4 MOORLAND DISCOVERY

Ecology Activities



Bird Fact File – Curlew

Numenius arquata



SIZE: The curlew is a large wading bird and is very easy to identify because of its very long curved bill.

HOME: The curlew breeds on the moors near open pools of water. They usually gather in flocks and can also breed on wet meadows or bog areas.

MIGRATION: Curlews are a coastal bird spending the winter by the sea. They migrate during the summer to breeding areas.

FOOD: The curlew is wonderfully adapted for hunting for food below the water or in soft mud. The bird uses its long bill for hunting out worms, shellfish and shrimps hidden under the surface that other birds can't reach.

CALL: Bubbling cor-wee

SPECIAL BECAUSE: The curlew can also live up to 31 years!

4 MOORLAND DISCOVERY

Ecology Activities



Bird Fact File – Red Grouse

Lagopus lagopus



SIZE: A medium-sized bird, a bit like a small chicken.

HOME: The red grouse lives in the north and west of Britain and in Ireland. The grouse only lives on heather moorland and nests on the ground in amongst the heather.

MIGRATION: The red grouse does not migrate.

FOOD: The grouse eats young shoots, flowers and seed heads mainly of heather. Young grouse get protein from insects in moorland bog pools

CALL: Scolding 'go-back back back'.

SPECIAL BECAUSE: The red grouse is a very special bird for the British moorland as it has helped to shape the moorland and has made it look the way it does today. The moorland in the past was managed, and in some places is still managed, to provide the best breeding environment for the grouse. The grouse moors are areas of short young heather for food, next to older heather for cover and breeding. These birds are also managed for hunting and, as a result, the red grouse has influenced both the moorland and the economy of the area.

The red grouse is also very well camouflaged for its habitat and is difficult to spot. If you're lucky you will hear its whirring wings as it jumps out of the heather before you, gliding low and fast over the moorland.

4 MOORLAND DISCOVERY

Ecology Activities



Bird Fact File – Dunlin

Calidris alpina



SIZE: This is a small wading bird, with a much smaller and shorter bill than the curlew.

HOME: Northern Britain and Europe. The dunlin breeds during the summer in wet short grassy areas, quite often on high ground.

MIGRATION: The dunlin, like many moorland birds, is migratory. The moors are used as a breeding ground during the summer months. In the winter they flock to seashores and estuaries.

FOOD: They eat insects, snails and worms.

CALL: A rough treep.

SPECIAL BECAUSE: During the winter dunlin are our commonest small wading bird found on marshes, tidal mud flats and shallow shores around the country.

4 MOORLAND DISCOVERY

Ecology Activities



Bird Fact File – Ring Ouzel

Turdus torquatus



SIZE: About the same size and shape as a blackbird, but with a white, half-moon shape across its breast.

HOME: The ring ouzel makes its nest in the steep rocky boulder-strewn slopes of places like Stanage Edge. The nest is on the ground under the edges of boulders with grass and bracken around it for protection.

MIGRATION: The ring ouzel only lives in Britain for six months of the year, during the summer to raise its young. The ouzels then leave for warmer weather in North Africa.

FOOD: Ring ouzels enjoy a diet of insects, worms and berries.

CALL: Loud rattling tac-tac-tac.

SPECIAL BECAUSE: In the Peak District the ring ouzels are at their most northerly breeding range. They breed in the rocky areas, and have in the past been disturbed by the numbers of climbers using these areas. Over the past few years climbers have worked with the National Park and have volunteered not to climb in some areas, to allow these rare birds to breed. During summer 2006 ten ring ouzel chicks were successfully reared at Stanage Edge with the help of climbers and the National Park.

4 MOORLAND DISCOVERY

Ecology Activities



Bird Fact File – Short-eared Owl

Asio flammeus



SIZE: This is a medium-sized owl, but has very long, narrow, slightly-pointed wings.

HOME: The short-eared owl nests on the ground in amongst the heather or on bogs and meadows. They make their nests in a scrape in the ground.

MIGRATION: Northern breeding owls move south and west in the autumn.

FOOD: They mainly eat voles and other small mammals.

CALL: Low hooting song. Barks when alarmed.

SPECIAL BECAUSE: Short-eared owls are diurnal, which means they hunt during the day as well as at night. Numbers of these wonderful birds are rising in the Peak District with 27 breeding pairs recorded in 2004. Short-eared owls have suffered in the past from hunting and loss of habitat. This is improving, but they still suffer nest disturbance from dogs and people.

4 MOORLAND DISCOVERY

Ecology Activities



Bird Fact File – Lapwing

Vanellus vanellus



SIZE: Medium-sized wading bird, about the size of a pigeon, very easily identified because of its colour and its crest of feathers.

HOME: The lapwing is a bird which breeds on the moorland fringes, usually in open flat fields and areas of long grass. It nests in a scrape in the ground which it lines to protect its eggs.

MIGRATION: The lapwing moves between lower waterlogged fields and coastal areas during the winter, to higher areas for breeding during the summer.

FOOD: The lapwing eats worms and insects.

CALL: Wheezy, drawn-out pee-wit.

SPECIAL BECAUSE: The lapwing is one of the most easily identified birds on the moor because of its wonderful feathers and colours. It is dark metallic green and white, with orange under its tail and a thin crest of black feathers on its head. The lapwing is also very easily spotted when flying because it has large, rounded wings nick-named 'frying pan wings' and has a floppy, tumbling flight. The lapwing is also known as the 'peewit' after the call it makes.

4 MOORLAND DISCOVERY

Ecology Activities



Moorland Food Chain Mobile

This activity is designed to help groups understand more about food chains and how they work. It shows very simply the concept of a food chain from plants to herbivores to carnivores. This is a fun hands-on activity which would make a nice classroom display.

Materials needed

One sheet per pupil
Coloured pencils or paints
Scissors
String

How to do it

This activity should take around 20–30 mins

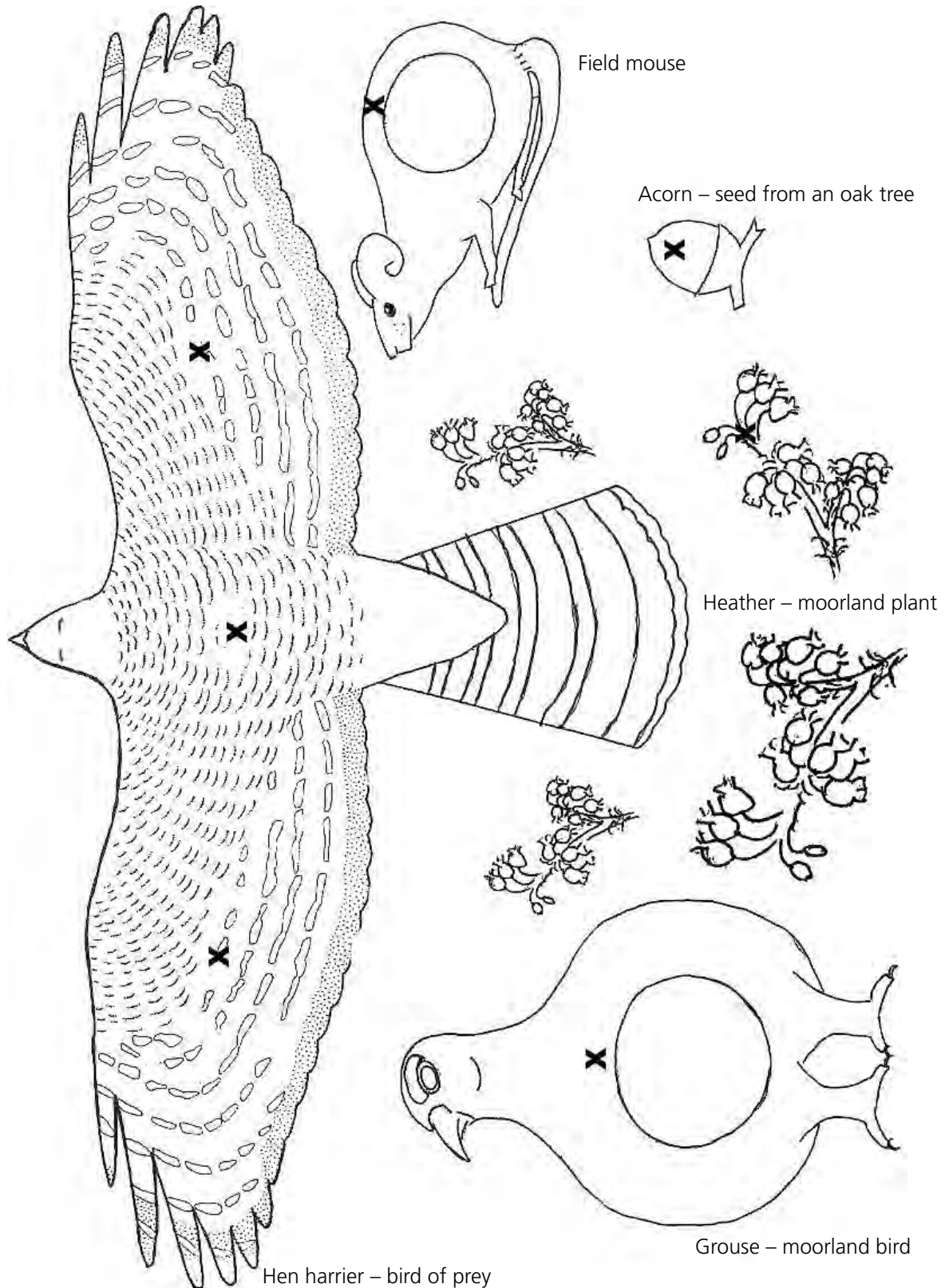
To make the food chain mobile:

- Pupils should (using photos) find out what each of the animals and plants looks like.
- Then colour or paint each section.
- Cut out each animal or plant.
- The grouse and the mouse both have circles in their middles; this should be cut out as well so that their food can be hung where the stomach would be.
- The X marks the point where a hole should be for the string.
- The mobile should be fastened together so the bird of prey is at the top and the mouse and the grouse are hanging off each wing. The grouse then in turn eats the heather and the mouse eats the acorn.

4 MOORLAND DISCOVERY Ecology Activities



Moorland Food Chain Mobile



4 MOORLAND DISCOVERY

Ecology Activities



Moorland Animal Masks

This is a great fun art activity to support work done in the ecology section. These masks also make wonderful costumes for the moorland play 'The Snow Hare's Woolly Jumper' available on the Moors for the Future website: www.moorsforthefuture.org.uk

Equipment needed

A2 card
Scissors
Paints
Masking tape

How to make a moorland animal mask

This activity should take one to one-and-a-half hours.

- All the animal masks are made from one sheet of A2 card. The card should be medium weight and can be of any colour.
- First fold the sheet in half along its length. The bend made in the middle will make the top of your animal's head.
- Then hold your template along the top of the fold so the flat top edge of the template meets the fold in the paper and draw around the template. Don't forget to draw around the shapes for the eyes and ears.
- Once you have drawn round the template cut each section out. You should have two eye sections, two ears (if your animal has ears) and one head section with the join in the card down the middle.
- Next, using a pair of scissors, make several small cuts in your mask sections so they can be folded. Follow the guidelines on the pictures to see where to put your cuts.
- Now make the back of your mask. Bend the back section down where you made the cuts and fold the side in; this should be held together with masking tape. For the grouse and the curlew you will then need to put masking tape along the top of the beak to hold the shape of the mask together. For the hare, fold over the nose section to create the face.
- Once you have the shape of the head right you can look for the best place to fix the eyelids. Use masking tape around the semi-circle edge to fix the eyelids in place. Then for the hare, fix the ears in place. Fold the tabs over each other and stick with tape.
- Once this is complete you should be ready to paint your mask; acrylic paint gives the best finish, but any paint will do.
- For the final touch use a strip of card stapled into a band, measure this to the child's head then staple it inside the mask.

> [Mountain hare template](#)

> [Red grouse template](#)

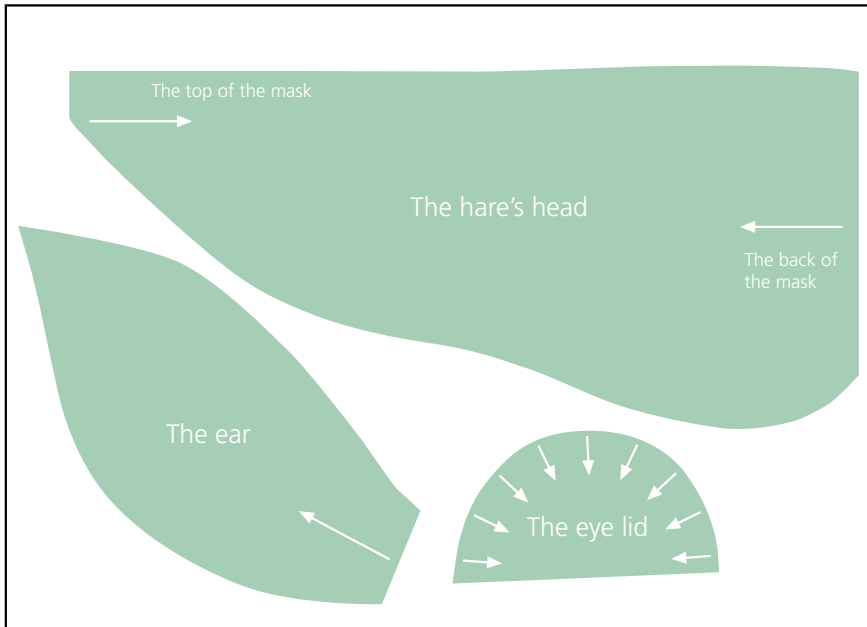
> [Curlew template](#)

4 MOORLAND DISCOVERY Ecology Activities



Moorland Animal Masks

Mountain hare mask



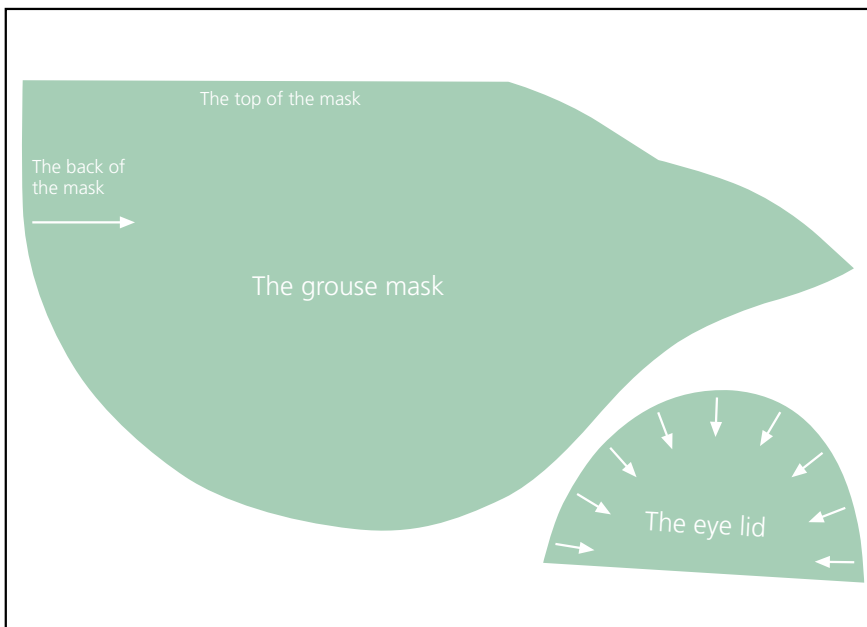
Dimensions

Head=40cm long,
19cm deep, nose is
2cm deep. back of
mask is 17cm deep

Ear=25cm long,
12cm wide, 5cm at
base

Eye lid=14cm across,
8cm high

Grouse mask



Dimensions

Head=24cm long at
the top, an extra
16cm to tip of beak,
23cm deep, back of
mask 8cm deep

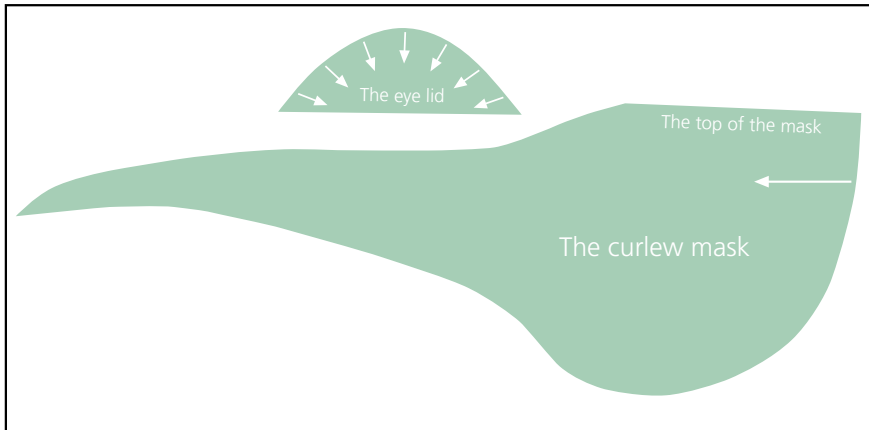
Eye lid=16cm across,
9cm deep

4 MOORLAND DISCOVERY Ecology Activities



Moorland Animal Masks – continued

Curlew mask



Dimensions

Head=17cm long at the top, the rest of the beak should fill the length of the card, 22cm deep, back of mask 10cm deep

Eye lid=16cm across, 7cm deep



The finished masks! Use books or pictures to paint the animals as accurately as possible.

4 MOORLAND DISCOVERY

Ecology Activities



Animal Movement Game

This game can be used as a fun activity or to support the moorland play. For the 'Snow Hare's Woolly Jumper', a short fun play introducing groups to adaptation and the moorland habitat visit – www.moorsforthefuture.org.uk

This game is a great way to get your group thinking about how animals might move. It will also help them think about their performance and build some depth to the characters.

First print out the sheet below and cut it along the lines into individual cards.

This activity can be done on an individual basis, where one child at a time receives a card and has to act it out to the rest of the group (or to a partner) while they guess what the movement is.

The activity may also be done as a whole class game so you read out each card and each child does the same movement whilst moving round the classroom.

SOARING FALCON	DIVING OWL
FLAPPING GROUSE	CREEPING FOX
SCURRYING MOUSE	HUNTING HEN HARRIER
RUNNING HARE	SINGING RING OUZEL
CHASING FOX	WANDERING SHEEP
PECKING CURLEW	PREENING LAPWING
HOPPING FROG	DIGGING HARE
BUZZING BEE	SLITHERING ADDER
GRAZING DEER	QUIVERING BUTTERFLY



Peak District Moors – A Water Store

The rivers and streams of the Peak District helped shape and mould the landscape we see today. The rivers are an essential part of the landscape supporting an amazing diversity of wildlife, some internationally rare. As well as supporting wildlife, water is also essential to people and we have used the rivers of the Peak District over thousands of years. From cotton mills to reservoirs, we have turned the high rainfall of the Peak District to our advantage.

From the Victorian period onwards, the Peak District was seen as a source of fresh, clean water for the ever-growing surrounding urban conurbations such as Sheffield and Manchester. The heavy rainfall runs off the moorland in a series of brooks and streams, all feeding into river systems and the wider valleys below. By damming these valleys, the Water Companies are able to collect, treat and distribute the water. A number of valleys have been dammed, probably the most well-known being the Upper Derwent Valley. Today, the reservoirs and rivers are a focus for recreation and conservation, as well as supplying the surrounding towns and cities with clean water.

The moors of the Peak District form a huge water store – almost another type of reservoir in their own right! The peat bogs store rainwater like a sponge, which is a vital part of the moorland ecosystem. Without this waterlogged habitat the moorland plants and insects would not survive, thus breaking the moorland food chain.

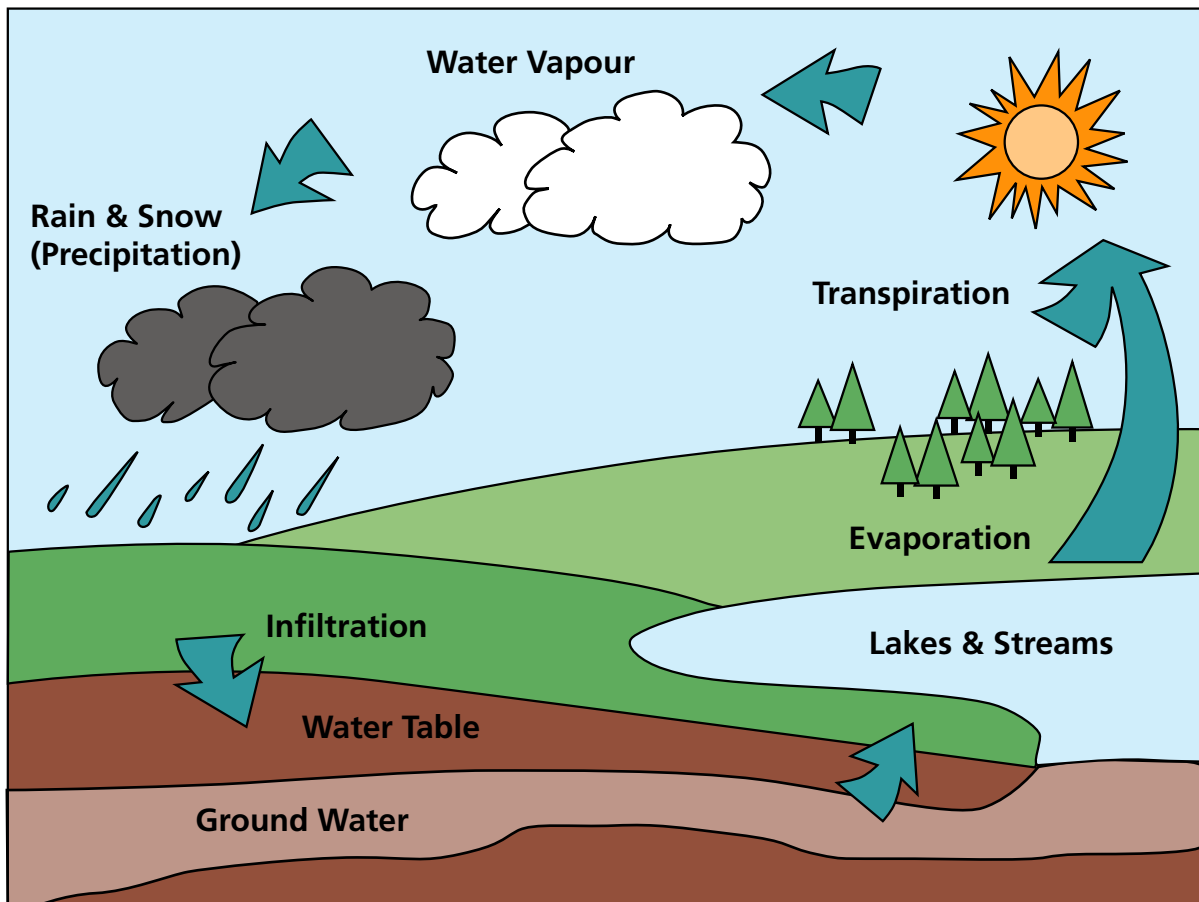
Where erosion of vegetation has occurred, the peat is easily washed away with the run-off of rainwater. This has a knock-on effect, particularly in the reservoirs, where a build-up of silt causes problems for cleaning the water. The peat in the reservoirs discolours the water and because of this the peat has to be removed before it can be used as drinking water.

For more information on the Peak District rivers and water visit www.peakdistrict-nationalpark.info



The Birth of a River

We are going on a discovery into how rivers are born and how they affect the land around us. First, let's think about how water gets into the rivers.



The water cycle (www.dnr.wi.gov)

Water droplets are held in the clouds until they get too heavy and rain down.

The water droplets hit the ground and run downhill; this is called a WATERSHED. All the water falling in one area runs down the hills all around until they meet together, forming a river; this is called a CATCHMENT.

5

MOORLAND DISCOVERY

Water Activities



National Curriculum links

Geography KS2 Investigating Rivers Unit 14
Geography KS3 Fieldwork

Activities

[RECORDING RIVERS](#)
[RIVER STUDIES RECORD SHEET](#)
[MARVELLOUS MEANDERS](#)
[MEANDERS RECORD SHEET](#)
[EXTRA RIVER ACTIVITIES](#)

Health and safety points

You may already have a site which your school has used regularly for river study visits. A popular site is Burbage Brook, which can be accessed via the Ringinglow Road or the Hathersage Road (A625) out of Sheffield. Please let the landowner know if you're planning a visit. Please also see [Visiting the Peak District National Park](#) for suggested locations for river studies.

> [River visit model risk assessment and self-led visit planning in info](#)

Burbage Brook

The source of the brook is on Burbage Moor, just above the Longshaw Estate. The brook flows through the Longshaw Estate to the valley bottom where it meets the River Derwent. It is a popular site for river studies, particularly at its source and along its upper course.

If you are planning a river study visit to this site please contact the Moorland Discovery Centre first; it is useful to try and spread the impact of visiting groups in this area.

There are a range of options for river study visits; it is possible to spend a full day following the course of the brook from its source to the confluence at the River Derwent; this is a linear walk so pick-up would have to be arranged near Grindleford railway station. Alternatively, time could be focused on fieldwork at the source and along the upper course.

Toilets for visitors are available next to the Longshaw Visitor Centre if needed.

5

MOORLAND DISCOVERY

Water Activities



Recording Rivers

Your challenge is to discover as much as you can about this river.

Site 1

How deep?

cm

cm

cm

How wide?

cm

Cross sectional areas = width x average depth

How fast (VELOCITY)?

Sec

Sec

Sec

Is the river bank...

HIGH or LOW

(circle one)

River bed size of pebbles



Site 2

How deep?

cm

cm

cm

How wide?

cm

Cross sectional areas = width x average depth

How fast (VELOCITY)?

Sec

Sec

Sec

Is the river bank...

HIGH or LOW

(circle one)

River bed size of pebbles



Site 3

How deep?

cm

cm

cm

How wide?

cm

Cross sectional areas = width x average depth

How fast (VELOCITY)?

Sec

Sec

Sec

Is the river bank...

HIGH or LOW

(circle one)

River bed size of pebbles



5

MOORLAND DISCOVERY

Water Activities



River Studies Record Sheet

Name _____

Location _____

Date _____

Site Name/Number	Valley Width	Angle of Slope of Valley Sides	Channel Width	Channel Depth	Speed of Flow (velocity)



Marvellous Meanders

Now we have discovered a MEANDER – a bend in the river. Water moves at different speeds depending on which side of the river it's flowing on. Can you sketch your meander?

Highbank

Erosion

Deposition

Draw some arrows to label your sketch.

Tremendous Tributaries

A second river joins our river; this is called a TRIBUTARY. Can you make a quick sketch of the point where they join? This is called a CONFLUENCE.

5

Water Activities



Meanders Record Sheet

Name _____ Location _____ Date _____

Measure the meander – this should help you to see how fast the water flows through different sections of a meander and what happens to the stones and soils it is transporting.

Section	Speed of flow (velocity)	Stream bed particle size – cm	Depth – cm
Inside Meander			
Middle of Meander			
Outside of Meander			

Make a field sketch of the meander you are testing. Include the vegetation on either side and use an arrow to show the direction of flow. Label clearly.



Extra River Activities

- Write up your investigation, try and make some conclusions about what your measurements tell you about the river;
- See if you can work out the cross-sectional area (width x average depth). Draw this on some graph paper for each section of river;
- Does the river get shallower or deeper as it gets wider?
- What happens to the depth of the river when it is narrower?
- How does the depth and width of the river affect the speed of flow?
- How does the slope of the river affect the speed of flow?
- Draw your own water cycle and river and label all the sections. How many river words do you know?
- Try looking at different maps. Follow the course of your river to see where its journey as a river ends;

> **Maps can be downloaded from the Ordnance Survey website through [Get-a-map](#)**

- Use a sponge to represent the peat bog moors. See what happens when more and more water (or rainfall) is poured onto it. This might help to illustrate how the moors act as both a water store and a watershed.
- Write a story about the river as a raindrop adventure, using the pupil's knowledge of the water cycle as a story plan.



Managing a Moorland

The fantastic expanses of Peak District moors always look stunning in late summer, when they are smothered in purple heather. The scent of heather honey hangs in the air and the buzzing of bees collecting the last of the season's pollen can be heard everywhere.

We are not the only ones to appreciate the purple moors – the heather provides a habitat for a wide range of moorland birds such as curlew, golden plover, lapwing, merlin and red grouse, which nest on the ground amongst the heather.

Protection of moorland areas

Most of the moorland in the Peak District is important on a national and international level. This is reflected in its level of protection. Most of the moorland is protected under four large SSSIs (Sites of Special Scientific Interest). This is the highest level of protection given in the UK. Together SSSIs cover 45,000 ha of the Peak District. Some areas, such as the blanket bogs and the breeding birds they support, are international rare habitats. As such, the four areas of SSSI also form part of a wider protected area called the South Pennine Moors SPA (Special Protected Area). This is a European protection standard which highlights the area's international significance for breeding birds.

Much of the management on the moorland is done under conservation agreements with the landowner or tenant farmer. Schemes such as the Countryside Stewardship Scheme (CSS) and the areas within the North Peak Environmental Sensitive Area Scheme (ESA), support farmers in managing the moorland in a sustainable way.

Heather and grouse

Just as young heather begins to shoot in spring, the grouse are nest-building and rearing their young amongst the taller, fully grown heather, where they find shelter and protection from predators and from the weather.

As the young grouse chicks grow, they need protein to sustain them and so tend to feed on the masses of insects, which can be found around the boggy pools amongst the peat. Adult grouse are less dependent on protein but will eat young, tender shoots of heather and bilberry.



Red grouse

Therefore, the grouse need variety in their habitat:

- Tall heather for nest-building and protection from weather and predators;
- Young heather shoots and bilberry for adult birds;
- Wet, peaty pools for young chicks.

Gamekeepers aim to provide this type of varied habitat by controlling the growth of heather across the moors.



Managed Moorland Burning

Landowners and gamekeepers manage the moorland mainly for grouse but also for other birds and wildlife. Part of this traditional management involves burning off patches of heather. This is always done in a very strictly controlled manner, to minimise the risk of unwanted fire damage.

The gamekeepers know the terrain so well that they are able to use natural features, such as rocks and gullies, to act as 'fire breaks'. They may also cut strips of heather and rotavate the soil to create a 'break', and use beaters to damp down the flames, in order to control the spread of the fire. By burning the heather in this way a mosaic of different ages of growth is achieved and new shoots are encouraged to grow. Where bilberry grows amongst heather, this will often grow back more quickly, creating a patch of green amongst the blackened heather stems.



Controlled burning of heather by gamekeepers

The strength and direction of the wind plays a major part in the setting and managing of a controlled burn and can alter the effect of a fire on the heather stems, roots and seeds. Weather conditions are always taken into account before a controlled burn takes place.

Controlled heather burning is carried out on sections of moorland over a 15–20 year period, during the autumn and winter months. It only takes place between 1st October–15th April to avoid the nesting season and is carefully carried out in specially chosen areas.

Controlled burns

A controlled burn is **controlled** because:

- The specific site is chosen;
- The weather conditions are taken into account;
- The time of year is chosen to avoid burning nests and eggs;
- The way a fire is lit and worked on is decided;
- The size of the burn area is chosen.

An uncontrolled fire is **devastating** because it:

- Can be started anywhere;
- Can happen at any time of year (usually spring and summer);
- Can be any size;
- Is not managed in any way.

🔊 Why not listen to the gamekeeper talk about fire management in the aural history section?

🔊 Why not listen to the gamekeeper talk about grouse management in the aural history section?

The Moors for the Future partnership has been working with Hallam Environmental Consultants (Sheffield Hallam University) who have undertaken eight separate interviews for a pilot 'Moor Memories' oral history project.

It aims to create a permanent record of the lives of the people who have lived and worked on the moors and who have contributed to the way they are today. All the recordings made as part of the 'Moor Memories' oral history project have been fully transcribed and will be archived in the research suite at the Moorland Centre (Edale) for research purposes. Snippets from the project are included in the Management and Recreation sections of this pack.

The voices you'll hear are Fred Mitchinson, local gamekeeper and John Barrow, one of the first Peak District National Park Rangers.



Moorland Fires

Accidental fires are devastating

In a controlled fire only the vegetation is burnt, and only in a small area. In an accidental fire the peat (which can easily dry out in summer) burns as well, often for weeks at a time over a wide area.

- Large areas of vegetation can be lost. Some plants may take ten years or more to recover – some may never grow back;
- Burnt areas could be invaded by 'foreign' plants, which are less useful for food and shelter to the moorland creatures;
- Young birds and small creatures are killed and nests are destroyed;
- Grazing land for sheep is lost;
- Large, bare areas of peat can be easily washed and blown away by the rain and wind, leading to moorland erosion.



How do uncontrolled fires start?

- Discarded cigarettes

Most soil is largely made up of fine grains of various minerals which are not flammable. The 'soil' on the high moors however, is actually peat – which is decayed plant material. In summer this can get very dry. A cigarette stubbed out in dry peat is not actually put out but can smoulder for a long time (sometimes for days) before flaring up into a fire.

- Camping stoves and barbecue trays
These can set fire to dry moorland grasses.

- Arson

Unfortunately some fires are started by vandalism. These fires are devastating – destroying plants, animals and their habitats.

If you see a fire call 999.

How are fires put out?

- Fire Plan

Each moorland in the Peak District has its own plan of action in case of a fire. This shows the best access routes and the nearest places to find water in the area;

- Small vegetation fires can be put out using fire beaters;
- Moorland fires can be put out using water. This is not as easy as it sounds – there are no taps on the moors! Water is transported by:
 - Pump from a nearby stream;
 - Containers or pillow tanks carried on off-road vehicles;
 - Hand-operated backpack sprayers;
 - Helicopter, which carries a large bucket underneath that is refilled by 'dipping' it into a nearby pond or reservoir.



Moorland Fires



The charred remains of moorland after an accidental fire

Fire fighting is expensive

Helicopters are often used to help with fire fighting. They are a vital tool – often the only way of getting enough water to the site of a moorland fire.

Each helicopter can cost up to £6,000 per day to hire – and on some of the larger fires a helicopter can be required for four or five days. Sometimes several helicopters are needed.

How can you help?

When the moors become dry and there is a risk of fire, signs are put up warning visitors to be careful.

- Always be careful not to start a fire;
- Always report a fire as soon as you can to the emergency services by calling 999. Try to pinpoint the location of the fire on a map;
- If you see someone else being careless with matches or cigarettes explain to them the damage they could cause;
- Do not take anything onto the moor which may cause a fire, e.g. cooking stoves, barbecue trays;
- Avoid smoking;
- At times of high fire risk the moors may be closed to public access. Please respect this decision and do not go onto the moors.

The Fire Operations Group

Following a spate of large moorland fires in 1996, a fire fighting resources group was formed to co-ordinate information on the location of personnel, water supplies, routes for access to moorland and the provision of fire fighting equipment. This group, known as the Fire Operations Group (FOG) is a non-statutory organisation and its primary aim is:

To protect from wildfire, the unique moorland heritage of the Peak District National Park.

For more information on this group visit: www.moorsforthefuture.org.uk

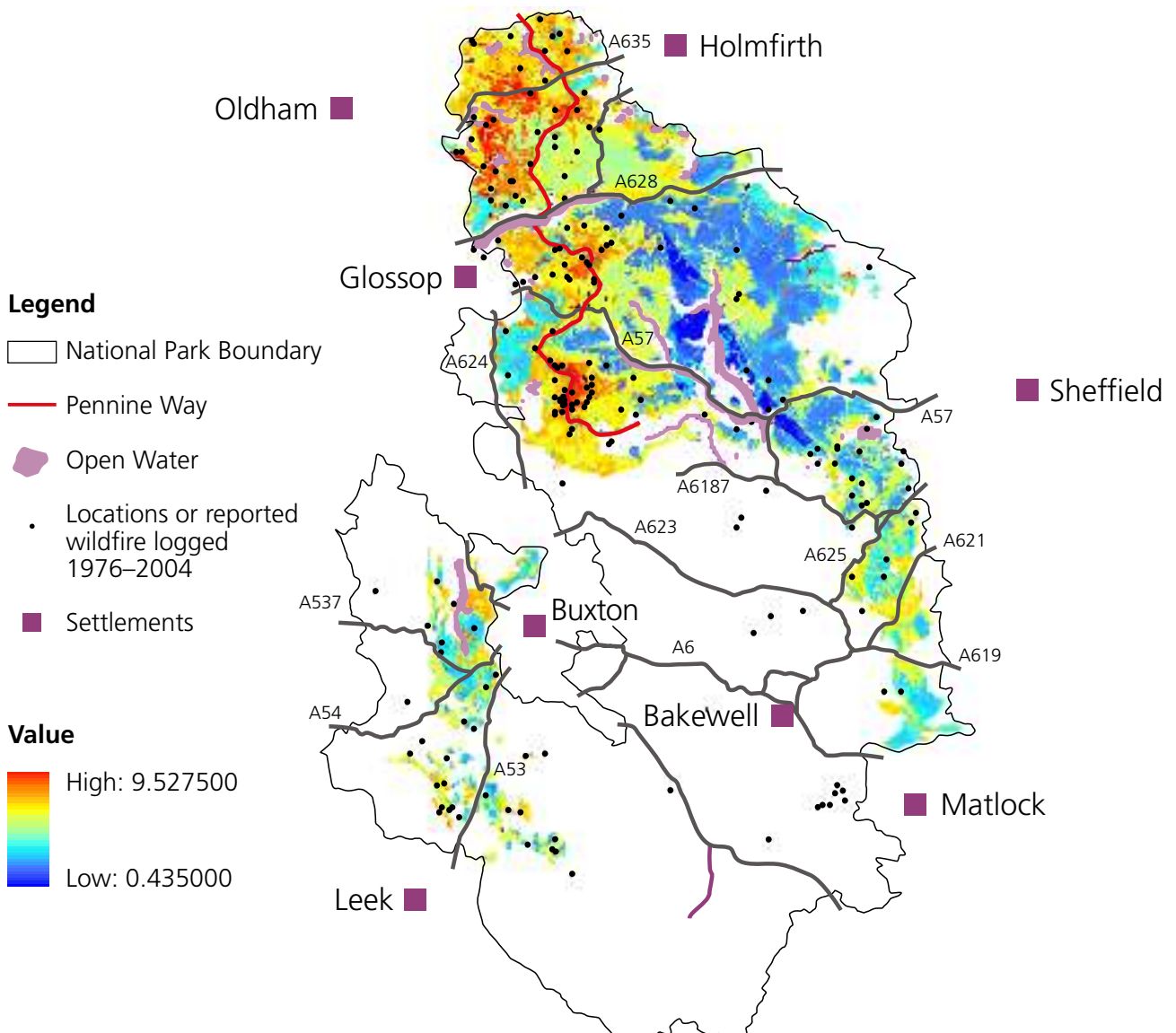


Closure Policy

The decision to close access land comes from the Meteorological Office and the fire severity index. This index shows the chances of a fire starting on a scale from 1–5. Once the fire severity index reaches 5 the moorland is automatically closed.

View the fire severity index at: www.openaccess.gov.uk

As well as the fire severity index the Peak District now has a fire risk map. This map shows the potential fire hot spots. This allows targeted fire plans to be made for the most 'at risk' areas. The map shows the hot spots in red where the vegetation type, location of settlements and public access combine to increase the risk of fire.





Moorland Restoration

Wildfires have devastated some areas of our most valuable moorland habitat within the Peak District National Park. The Moors for the Future Partnership was formed to bring moorland landowners together to help co-ordinate the landscape-scale restoration that was needed to restore these damaged areas.

The restoration of the moorland was needed to prevent the massive erosion of peat which was taking place. The wildfires which damage these areas burn all the plant cover off the peat. In very severe fires in hot weather even the peat can catch fire, which means that the plants can't re-colonize because the peat is damaged and unstable. Research into moorland restoration has driven the ground-breaking work taking place in the Peak District.



Aerial photograph of Bleaklow, just one section of fire damaged moorland

Moorland restoration story

Geojute, which is a biodegradable fabric, is spread across the moorland to hold the valuable peat and reduce erosion.



Seed is then spread across the area. The geojute allows the seed to take root and hold the peat in place.



Heather brash is then spread over the establishing grass. This is the best way of re-introducing heather seed and allowing it to take root.



This is a long-term project but even after one year this management makes a difference to the landscape.



Aerial photo of Bleaklow after Moorland restoration work



Gully Blocking

The need to restore moorland follows a range of factors which have contributed to the erosion of plant life from the tops of the moors and subsequently the loss of peat. Some areas of the Peak District moors are so badly eroded that the bedrock beneath the peat soil is clearly visible. The lack of vegetation effects moorland wildlife, with a knock-on effect throughout the moorland food chain. This loss of peat also effects us, as large amounts of peat enter our reservoirs. As a result local water companies have to spend more time and more money on filtering the peat out of the water to make it clean for us to drink.

Causes of erosion – visitor impact, accidental fire, over-grazing, climate change, pollution over a long period of time from industry and traffic.

Gully blocking

One of the ways in which organizations like The National Trust, The Peak District National Park Authority and The Moors for the Future Partnership are trying to combat peat erosion is by blocking up gullies on the tops of the moors, to try to encourage a build-up of peaty soil and to increase the water table level. These gullies are deep, the bedrock is exposed and there is no vegetation.

The work has involved an enormous amount of surveying and mapping – when you're up on the moors, one gully looks pretty much like another, so a database of computer-animated maps is held, where records of gullies to be blocked and gullies which have been blocked can be held and monitoring updated. (This research has been carried out by the University of Manchester and the University of Leeds and a summary of the findings can be found at www.moorsforthefuture.org.uk).

Materials for gully blocking have been tested on the moors – these have included stone, sheep wool, wood and plastic piling.



Planting

Following successful blocking of gullies, planting can begin. The plan is to plug the water-sodden blocked peat gullies with cottongrass, which has been grown from seed. Part of the process involves collecting seeds during the summer months which can then be germinated to produce seedlings. Once the plants take root in the peat, their roots enable the peat to stay in place and build up within the gullies.

6

MOORLAND DISCOVERY

Moorland Management Activities



National Curriculum links

Geography KS3 Enquiry, Visual Literacy and Communication

Activities

FIRE REPORTED!

Fire Reported!

Aim

Use OS maps to find information.

Increase awareness of the difficulty of extinguishing moorland fires.

Objectives

Use 6-fig grid refs to locate specific points on a map and develop an action plan for fighting a fire.

Method

Pupils are given a report of a fire seen on the moors, a 6-fig grid ref and a section of OS map showing a wide expanse of open moorland. The task is to locate the fire site and to then work out how to access it with fire equipment on vehicles.

They need to consider

1. Using one off-road vehicle and finding roadside parking for others. How far will all the fire team have to walk and how long might that take?
2. Water sources – they have pumps and long lengths of hosepipe, which they can use to take water from springs, streams, ponds etc.
3. Large water source for helicopter use.
4. Access points for visitors and where to set boundaries for safety.

Extra challenges

1. Give a wind direction – consider the direction in which the fire might spread. This will have implications for water and people.
2. You need to try and fight the fire from either side ideally, to pinch it in. Never fight a fire from the front!
3. Lengths of hosepipe – you have three pumps and four hoses; two are 50m long and two are 30m – are they long enough to reach from the water source to the fire site?

Activity 2

Raising awareness about the dangers accidental fires can cause is a challenge. One way is to put notices up at moorland access points and car parks to remind visitors not to put cigarettes out on the ground, or use matches, or light fires or barbecues. These notices are put up during the summer months, particularly if it has been very dry.

How can we encourage people to stop this happening without encouraging others to get excited about the dangers of fires?

We would welcome ideas and poster designs which would be relevant to young people particularly.

If you have anything to send please post it to: The Moorland Discovery Centre, Longshaw Estate, Sheffield, S11 7TZ



Recreation and Tourism on the Moors

The Peak District National Park is one of the most visited National Parks in the world, with millions of people choosing to visit each year. This is mainly due to its accessibility from major cities such as Manchester, Sheffield, Leeds and Derby. Wherever you live in England, you're never too far away from the Peak District National Park, with one-third of the population living just an hour's drive away. As a result the Peak District National Park has a huge amount of tourism and recreational activity happening within its boundaries. The aim of the Peak District National Park Authority and others who own and manage the land like the National Trust, the Forestry Commission, to name but a few, is to balance recreational needs with sustaining a rare and fragile environment.

A brief history

The Peak District moorlands are famous for their accessibility, dramatic scenery and recreational activities. They are also famous for their historical role in shaping the recreational freedoms we have today.

During the 1930s thousands of workers from the busy industrial cities of Sheffield and Manchester used to take the train out to the Peak District on a Sunday to go walking in the countryside. However, large areas of the moorland were closed to them because the landlords did not permit access to the public. Protests for more access to the moorland began to build, the height of the conflict was the Kinder Mass Trespass on the 24th April 1932. On that day between 400–600 people from Manchester, Sheffield and other surrounding areas, trespassed on to Kinder Scout (Kinder Scout is one of the Peak District's most well-known high moorland areas). This protest, and others like it, helped to raise the issue of countryside access to a national level, resulting in the Access to Mountains Bill, which granted people access to walk on public rights of way across open countryside. This act paved the way for the 1949 National Parks and Access to the Countryside Act. This further improved people's right to walk in the countryside and enjoy other recreational activities within the Peak District.

The Peak District was the first National Park to be designated in the UK under the 1949 National Parks and Access to the Countryside Act. The 1932 Kinder Mass Trespass was an organized protest for the right to walk in open countryside.



The Kinder Mass Trespass (1932)



Visitor Facts and Figures

Source: The State of the Park report – www.peakdistrict.gov.uk/index/pubs.htm

Useful links for other visitor information:

www.moorsforthefuture.org.uk/mftf/research/research_introduction.htm

The main activities of visitors to the National Park

Activity	%	Activity	%
Walking over 2 miles	52	Shopping	31
Visit villages/market towns	47	Visit attractions	30
Restaurant/café	47	Mountain biking	9
Touring around	40	Visit events/festivals	7
Pub	39	Cycling	6
Picnicking	32	Climbing	5
Walking under 2 miles	32		

Day visits or longer?

Within the National Park it is estimated that there are 2.5 million overnight stays. Thus over 80% of visits to the National Park are day visits.

Type of Accommodation	%	Type of Accommodation	%
Self-catering/youth hostels	32	Staying with friends/relations	11
Serviced (hotels, B&B etc)	24	Camping	11
Caravans	20	Other	2

How do people travel to the Park?

87% of visits (between 16.2 and 20 million visits) each year are made by car, with another 1.5 million visits by public transport. Visits by Peak District residents, or other visits on foot, account for another 1.2 million, whilst a further 3–3.6 million people drive through the Park just to admire the scenery.



Walking and Open Access

By far the greatest percentage of visitors (52%) come to walk in the Peak District. There is a breathtaking array of walks of different lengths, passing through a tremendous variety of landscapes. The Peak District also has some fantastic long distance walks which cross it, including the Trans-Pennine Trail, the Pennine Way and the Limestone Way.

In 2000 the Countryside and Rights of Way Act (CROW Act) was introduced in the UK, which opened up the countryside even further and gave new rights of access. The Peak District was the first National Park in the UK to introduce the new open access rights. These came into force on the 19th September 2004, with 250 sq km coming under the new open access regulations. This doubled the area of open moorland available for people to walk across. As a result of this increased access to new areas, the park is putting in 400 new gates and stiles and 1,200 new information signs.

For more information visit: www.countrysideaccess.gov.uk



To know if you're in an open access area, look for this sign:

Climbing and bouldering

The Peak District is also famous for climbing. With its large exposed gritstone edges it is a mecca for climbers around the world. The Peak District boasts many climbing areas and some famous spots such as Stanage Edge, which has 1,200 climbing routes, with climbs for beginners and professionals in close proximity. On a good climbing day at Stanage Edge or the Burbage Valley or the Roches, you can see climbers queuing for good routes. In recent years bouldering has also become very popular.

Paragliding

On calm days above the moorland in some areas you will see paragliders circling. The paragliders need a launch area, which sometimes brings them into conflict with climbers. The paragliding and hang-gliding groups have permission to launch off certain sites, outside the lambing season, so they don't disturb the lambing sheep. The Peak District is one of the most popular areas in the country for paragliding.

Mountain biking

The Peak District is a very popular area for mountain biking, with many routes of varying difficulty criss-crossing the park. Cyclists are expected to use bridleways rather than footpaths.

Horse riding

The Pennine Bridle Way, which runs partly through the Peak District, is open for horses and cyclists to use.

Dog walking

The moors are wonderful places for dog walks. However, during the bird breeding season, loose dogs can cause a big problem for the ground nesting birds. Walkers on open countryside are encouraged to keep their dogs under close control at all times, but especially during the breeding season or when near farm animals. Dog owners also need to control their dogs during lambing time, as a pregnant ewe can easily lose her lambs if stressed by an excited dog.

A lot of work is done to encourage dog control on the moorland; for the most up-to-date information visit: www.moorsforthefuture.org.uk

Visit the Moor Care section and look at the 'Paws on the Moors'. This includes a new dog podcast about being responsible with dogs on the moors.



Positives and Negatives for Conservation

Local economy

It is estimated that visitors spend almost £450 million in the wider Peak District area, which supports over 14,200 jobs. Within the National Park, the estimated visitor spend is £185 million, which supports 3,400 jobs, representing 27% of the total employment within the National Park area.

Through shops, attractions and accommodation, visitors provide an income and livelihood for local villagers and farmers. Farming in the upland moorland areas of the Peak District is not always a profitable occupation and many farmers are encouraged to diversify to raise more income. The level of farm-based holiday accommodation within the Park has increased by 45% between 1991 and 2011. This is an important part of rural regeneration, as it supports farmers and helps them carry out their more traditional role of countryside stewards.



Grouse shooting also contributes a large amount to the local economy. Some individuals or groups will pay to spend a day shooting on the moors. This helps pay for management work carried out on the moorlands and pays for the estate gamekeepers. As well as bringing money into the grouse moors, the shooting parties spend money locally in hotels and restaurants and, hence, improve the wider economy of the moorland areas.

Positives for conservation

Tourism can encourage countryside conservation and the preservation of historic buildings and sites. Many sites have been protected or restored because of their value for attracting tourists. Many have been restored as visitor attractions. Redundant farm buildings have found new uses as holiday accommodation or camping barns. Tourism helps put money into the economy so local landowners and conservation bodies such as the National Trust can maintain high standards of landscape quality.





Positives and Negatives for Conservation – continued

Negatives for conservation

Many concerns have been raised about the impact of recreation and tourism on the National Park and its moorland habitats; these include:

Rush hour congestion through villages and beauty spots – some of the more popular areas attract large numbers of visitors, resulting in pressure on roads, car parks and local facilities – particularly during the summer. The local community may feel ‘pushed out’ by tourists.

Erosion of footpaths – some of the most popular routes suffer erosion, which damages the soils and sensitive vegetation. In some areas this is increased by off-road vehicles and mountain bikes.

Accidental fire damage – moorland areas are very vulnerable to accidental fires caused by dropped matches, cigarettes, camp fires or barbecues during the hot summer months. These fires can lead to massive habitat loss.

Damage and disturbance to wildlife – many moorland birds nest on the ground so they are easily disturbed by dogs, walkers, climbers etc during the nesting season.

Increased litter and urbanisation of the countryside – more visitors means more litter, and an increased need for signs, litter bins, toilets etc, which many people see detracting from the natural beauty of the countryside.

Managing tourism

The National Park Authority and landowners such as the National Trust are always trying to look at ways to manage tourism sustainably. The Peak District’s Sustainable Tourism Strategy was developed in 2000 by the Peak District Rural Development Partnership. The vision of this partnership is that recreation and tourism development must be sustainable to protect the Park for future generations to enjoy.

Case studies

There have been many successful partnerships working towards sustainable recreation and tourism. One example of these is the Stanage Forum, which has worked with many different interest groups to try and agree a new management plan for the North Lees Estate and Stanage Edge. This is one of the most loved and well-known areas of the Peak District and is visited by many thousands of visitors each year. The forum was set up to allow different groups to come together to agree the best way forward for the site. This included looking at car parking and signage, as well as the voluntary restrictions during breeding seasons.

For more information on the Stanage Forum visit:

www.peakdistrict.gov.uk/index/looking-after/stanage.htm

Kinder and High Peak Advisory Committee was set up by The National Trust for representatives of different user groups, to meet with the National Trust on a regular basis, to increase communication and discussion around access and conservation issues for a range of different types of visitors. For more information on this contact the National Trust High Peak Estate Office on 01433 670368.



7

MOORLAND DISCOVERY

Recreation Activities



National Curriculum links

KS2 Literacy Strands (1 Speaking, 2 Listening and responding, 3 Discussion and interaction)
KS2/KS3 Citizenship

Activities

RECREATION AND TOURISM INVESTIGATION

ENVIRONMENTAL ASSESSMENT

ROLE-PLAY SUPPORT SHEET

STANAGE EDGE CAFÉ ROLE-PLAY SUPPORT PHOTOS

TOURISM ROLE-PLAY CARDS

THOUGHT TUNNEL

Recreation and Tourism Investigation

- Use the **Recreation and Tourism on the Moors** background information to provide the background for your visit;
- Encourage the group to do some research using the web links provided, either pre- or post-visit;
- If you're visiting the moorland use the environmental assessment sheet to aid your investigations;
- Look for signs of human impact – both positive and negative;
- Look at the landscape from the viewpoint of different users e.g. tourists, locals and owners etc;
- Why not think about a controversial issue to help focus your investigations?
 - A cafe and car park is planned for one of the Peak District's most visited and beautiful areas.
 - A local landowner of a large moorland estate is looking to diversify. He has applied to put a motor cross and mountain biking track in, along with a 4x4 driving experience on his land. Once you have visited the moorland and investigated some of the issues raised by recreation and tourism in the National Park, try following this up by doing a class debate.

7

Recreation Activities



Environmental Assessment

Site name _____

Site number _____

Have a good look around the area you are in. Give it a score of between +3 to -3 for each of the categories below.

Positive						Negative	
Very attractive scenery	+3	+2	+1	-1	-2	-3	Very unattractive scenery
Exciting							Boring
Good paths							Poor paths
No dog faeces							A lot of dog faeces
Clear signs							Unclear signs
Peaceful							Noisy
No litter							A lot of litter
Feels safe							Feels unsafe
Good car parking							Poor car parking
Close to public transport							No public transport
Total +							Total -
Overall total							

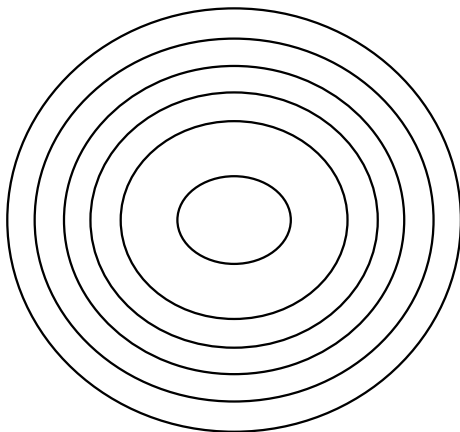


Role-Play Support Sheet

- Included in the pack are some materials to help support your role-play/class debate. Try using this role-play support sheet the **Stanage Edge café role-play support photos** to aid your classroom discussions.
- The **tourism role-play cards** are designed to give students some background to the group they will be representing and some guidance towards what the group's points of view might be. The tourism role-play cards could be supported by groups doing some research prior to the debate. A new management plan is being written for the area you have visited. You may also want to hold your debate with the idea that: 'You are invited to attend a steering group to put forward the viewpoint of your organisation on how the land should be managed for the next 2 years'. The aim of each debate is to look at the different points of view and try to reach a consensus where each group is represented.

Consensus-building

- To help draw some conclusions from your debate, it can help to try some consensus-building techniques:
 1. Once the debate is finished and each group has put forward their opinions, get them to think about their top three aims.
 2. The top three aims of each group should be written on separate post-it notes. These should then be posted around the outside of the target.



Draw this diagram on A1 flip chart paper

3. Each student may pick three aims they agree with out of all the aims posted around the target and move them forward one circle.
4. This should mean that the aims that most students agree with move closer to the middle. This should give you an agreement on the best way forward to prioritise the aims of the group.



Stanage Edge Café Role-Play Support Photos

Stanage Edge Before



Stanage Edge After





Tourism Role-Play Cards

The Ramblers Association

The Ramblers Association is a national body with affiliated regional groups.

Many of our members have been walking in the Peak for more than 30 years. We come out in large groups about once a month, and like to get here by bus. We love the countryside and enjoy the superb views and wide open spaces. We believe that preserving the footpaths and promoting open access should be one of the key aims and we wouldn't like to see any more car parks.

Additional point:

We would like to have more co-operation with landowners, to ensure that existing footpaths are always open.

British Mountaineering Council (BMC)

The BMC aims to protect the ethics and freedom of mountaineering and climbing in open country. It provides a service to its members and campaigns on their behalf.

We represent the climbing community who enjoy climbing and bouldering in the Peak District because it's a brilliant area for all climbers, from beginners to experts. The Peak District is the birthplace of climbing and is still one of the most popular climbing destinations in the country. The crowds aren't a problem for us but it can be annoying if you have to queue to climb. Unfortunately there are break-ins into cars and more and more car parks are pay and display.

Additional point:

How can climbing be pursued whilst not disturbing rare breeding birds?

Natural England

Natural England is a Government organisation which advises organisations on nature conservation.

We are particularly concerned with helping to increase the populations of rare and endangered species of wildlife, and preventing other species becoming rare. We aim to establish, maintain and manage 'Sites of Special Scientific Interest' (SSSI) and National Nature Reserves (NNR). We also undertake and support research. Another of our roles is to advise the government on nature conservation issues.

Additional Points:

Suggest how nature conservation, recreation and farming might be integrated. Assess the impact of various management proposals.

7

MOORLAND DISCOVERY

Recreation Activities



Tourism Role-Play Cards – continued

Family drive and picnic group

We're part of a large group of people who visit the Peak District to enjoy the scenery, doing short easy walks and having fun together. We love coming out with our families and we always have a great time. We want to be able to have easy access to good car parks with toilets and maybe a café and visitors' centre. Some of us find access difficult as we have limited mobility or young children in pushchairs.

Additional point:

Suggest areas for facilities – how can these be best fitted into the environment?

Tenant farmer

We rent the land we farm from the landowner. We have flocks of lambing ewes, which range over the moorland and its slopes. Lambing is from April to mid-May when the sheep are brought down onto lower land. It's not easy farming up here, what with the poor soil and bad weather. We are being encouraged to diversify into other activities, especially those linked to tourism such as B&B, campsites, farm shops etc. In fact the Peak District National Park Authority gives us grants to help us do this.

Additional Points:

A lot of visitors can cause problems to the area, as some do leave gates open, climb over walls, allow their dogs to chase sheep and leave litter. Traffic congestion is also a problem, resulting from large numbers of visitors to the area. These problems cost us time and money.

Landowner

We own land in the Peak District and our families have done for generations. The land used to be used primarily for grouse shooting, which can earn us as much as £1,000 per day per gun. The shooting season is 12th August–10th December. We also let some of our land to farmers for grazing livestock. There are many footpaths across our land which we maintain and we often see walkers on them. We understand the need to conserve the moors for the future as our families have been doing that for generations. Grouse shooting is key to the moorland and has helped shape the moors over the years. Traditional conservation of the moors benefits all the wildlife and helps to maintain the ecosystem.

Additional point:

It's a problem trying to make sure that visitors to our land use it properly and don't leave litter or light barbecues for their picnics. The land is important for wildlife so we have to get everyone's help to look after it.

7

MOORLAND DISCOVERY

Recreation Activities



Tourism Role-Play Cards – continued

Gamekeeper

We are employed by the landowner. It's our job to manage the moor to create the best habitat for the grouse to live in. We spend a lot of time up on the moor carrying out controlled burns, looking after fencing and other site management issues. We also have to be on the look out for wildlife which may harm or kill the grouse, and set traps out for them. Birds of prey can be a problem for moorland birds, and for us, because many are endangered species and so cannot be destroyed. In the spring and summer we sometimes have problems if visitors let their dogs run loose, particularly during bird nesting season, as most moorland birds nest on the ground and there is always the danger of accidental moorland fires.

Additional Point:

We have been considering proposals for improving the economy of the area through recreation.

Mountain biker

We love coming out to the Peak to explore the huge number of tracks. We would like to be able to access more routes, but a lot are footpaths and mountain bikers have to stay on bridleways only, to lessen the amount of damage which might be caused to some narrower footpaths. We are often blamed for causing a lot of erosion on the landscape but we only cause a part of the erosion; there are so many other people using the Peak District for different sports – it's not just us!

Additional Point: It's quite difficult to tell which is a bridleway and which is a footpath so sometimes we end up in the wrong place.

4x4 off-road driver

We really enjoy getting out to the Peak District in our off-road vehicles, up and down the hills and across the muddy tracks. We stick to the trackways we are allowed to use. We feel that we are a very misunderstood group; many people believe we are destroying the countryside and that motor vehicles do not belong on the hills because we cause noise and erosion, but some of the tracks we use have been old roads for hundreds of years. We feel we have as much right to enjoy our sport in the Peak District as any other group.

Additional Point:

At the moment there are very few areas we can use – the responsible drivers stick to those roads but there are some who do not, who spoil it for the rest of us.

Bird spotter

We come to the Peak District specifically to see the rare birds that live on the moors. We want to continue to see this wonderful habitat looked after and preserved, and the birds allowed to flourish. Disruption by visitors is detrimental to many of the rare birds that nest on the moorland areas. We often pick up litter on our walks which has been left by others, and we hate to see the destruction caused by fires on the moors. We would like to see more protection for the birds and the habitat as a whole.

Additional point:

We would like to see more birds of prey nesting in the Peak District.



Tourism Role-Play Cards – continued

United Utilities (Water company)

Our company owns large areas of land within the Peak District National Park as well as the reservoirs. We let our land to tenant farmers who manage it for farming and, in some areas, for grouse shooting. The water stored in the reservoirs comes directly off the moors, and in many areas it brings masses of peaty soil down with it from the tops of the moors which are eroded. Our water company is also a large employer, bringing much needed economy to the Park.

Additional Point:

It costs us a lot to clean the peat out of the reservoir water before it can be used.

Peak District National Park Ranger

Our job is a difficult one, working in partnership with many different organisations and landowners. However we represent the National Park and its aims:

- Conserve and enhance its natural beauty, wildlife and cultural heritage;
- Promote opportunities for the understanding and enjoyment of the special qualities of the National Park by the public;
- Foster the economic and social well-being of local communities.

This is a difficult balancing act and we are on the ground dealing with it every day. We want the best possible outcome agreed, but we need to make sure that the aims of the National Park are paramount.

Additional points:

Suggest ways to reduce conflicts between groups; look at methods of sustainable management that keep within the aims of the National Park.

National Trust Property Manager

The National Trust owns some large areas of moorland in the Peak District. I am in charge of a team of staff who manage the land with two main aims:

- That it is looked after and protected in the best way possible;
- The public are encouraged to visit and enjoy the special places which we are charged with looking after.

The mission of the National Trust is to look after special places forever, for everyone. We let a lot of our land to farmers and shooting tenants, with strict guidelines about how we want to see the land being managed. Our staff are constantly in touch with local tenants and communities to try to iron out any problems as they occur. We have a lot of work to do to try and restore huge areas of eroded moorland, which is costing a lot of money.

Additional Point:

We are a charity and rely on donations for all the work we do. We have to try to find ways of bringing income in to fund the work we do in the countryside.



Thought Tunnel

This re-emphasises the idea that there are two sides to a story.

The pupils make two lines facing each other. Each line has an opposing opinion about something; e.g. one side wants a car park/the other side wants to keep the space as a field.

The pupils quietly repeat their opinions as pupils take it in turns to walk through the tunnel, listening to conflicting opinions as they go.

Talk about how they felt afterwards.

Other thinking skills activities

> **Opinion line activity**

> **Cause and effect activity**



Climate Change: Here and Now

Climate change is a here and now issue and we need to adapt to it fast. We have to learn from our recent experiences of floods, storm damage, dry periods and seasonal change and recognise that the way we manage our landscape will increasingly be influenced by the impacts of a changing climate.

Climate change affects all of us – and we can all be part of the solution

What is climate change?

Climate refers to the average weather experienced over a long period. This includes temperature, wind and rainfall patterns. The climate of the Earth is not static, and has changed many times in response to a variety of natural causes such as the Ice Ages.

It is thought that the main human influence on global climate is likely to be emissions of greenhouse gases such as carbon dioxide (CO₂) and methane. At present, about 6.5 billion tonnes of CO₂ is emitted globally each year, mostly through burning coal, oil and gas for energy. Climate change is already happening. Globally, the ten hottest years on record have all occurred since the beginning of the 1990s. Current climate models predict that global temperatures could warm from between 1.4 to 5.8°C over the next 100 years, depending on the amounts of greenhouse gases emitted and the sensitivity of the climate system.





Evidence of Climate Change

Temperature Facts:

The 1990s was the warmest decade in the UK since records began in the 1660s;

England's temperature reached a sizzling 101°F (38.5°C) in 2003, the hottest temperature ever recorded in the UK;

Mean temperatures in central England have risen by about 1°C since 1900 (the climatic equivalent of moving from southern England to mid-France today);

The growing season has lengthened by about a month in central England since 1900, with the onset of spring occurring around two to three weeks earlier than just 30 years ago.



Rain and Snow Facts:

Annual summer rainfall has fallen by around 20 per cent since about 1900;

Winter rainfall is greater. The four wettest winters in south-west England since records began have all been in the last 10 years;

Many rivers reached their highest ever recorded levels in 2007.

Gales and Storms Facts:

The UK has become twice as stormy over the last 50 years, with an increase in heavy rain showers.



What Climate Change Means for Us

For the UK, climate change means warmer temperatures, wetter winters and drier summers, less snow, and higher sea levels, leading to an increased risk of flooding.

Across the globe, there may be severe problems for regions where people are particularly vulnerable to changes in the weather. Flooding, droughts, food shortages and the spread of disease are commonly predicted. The social, environmental and economic costs of climate change could be huge.

The rate of change

'Major investment is needed now in both mitigation and adaptation. The first is essential to minimise future impacts and the latter is essential to cope with impacts which cannot be avoided.'

'Avoiding Dangerous Climate Change', Defra, January 2006

The climate change we expect in the next 30–40 years will be due to our past greenhouse gas emissions. Climate change later this century will be determined by the emissions that we allow now. We need to adapt our way of life so that we can prepare for the changes that are already in the climate system, as well as limiting our future greenhouse gas emissions.





Peak District Issues

The Peak District habitats, especially moorlands, are very sensitive to climate change. Many species of plants and animals within the Peak District live either at their most northerly or most southerly range. This means that for every degree increase in temperature the climate, and therefore the wildlife habitats, move further north by 150km and higher in altitude by 100m. This would mean that animals living at their southern-most range in the Peak District, such as the mountain hare or the ring ouzel, would move further north and disappear from the Peak District moors.

Meanwhile, animals living in more southerly regions would move further north to become Peak District residents, changing the nature of Peak District wildlife. As a result of this movement of plants and animals across Britain species at their most northern range may become lost from the UK, even extinct.

Land use in the Peak District may change – there would be more opportunities for agricultural farming; can you imagine how a bottle of Peak District wine might taste?

Some of the most likely changes for the Peak District might be:

Warmer drier summers, increased risk of wildfires, increased visitor numbers, wetter, stormier winters.

Impact of climate change on wildfire risk in the Peak District



Increased hazard and increased vulnerability = Higher fire risk

The high fire risk is exacerbated by a reduced water supply in high moorland areas. The soil and vegetation will be at risk of igniting more easily. Increases in moorland fires may lead to an increased risk of moor closure and a greater amount of carbon released into the atmosphere.

Impact of climate change on peat erosion

The predicted wetter, stormier winters may lead to a higher intensity and greater amount of rainfall. This in turn could lead to increased peat erosion. An increase in peat loss would in turn lead to:

- Increased amount of silt washed into reservoirs and discolouration of water supply;
- Flooding;
- Loss of carbon;
- Loss of moorland habitat.

Conservation and land management

Across the Peak District moorland areas a large amount of research is being done on climate change and how to manage our environment in the best way for the future.

The pioneering work on the Peak District moors by The National Trust, The Moors for the Future Partnership, the Peak District National Park Authority and others is aiming to conserve our natural and cultural environment, as well as benefiting carbon storage. Wetland, peat land and soil conservation measures, together with sustainable farming practices, should help to prevent peat erosion and restore blanket bog. This will bring huge benefits to wildlife, landscape, water quality and access as it reduces carbon emissions from peat which is currently degrading.



Climate Scenarios for the Peak District

A series of climate scenario maps have been produced for the Peak District National Park by the UK Climate Impacts Programme. They were developed by the Hadley Centre and Tyndall Centre for Climate Change, using baseline climate data from 1961–1990, provided by the UK Met Office.

To produce these maps, the Peak District National Park was mapped in 5km squares. The average temperature and rainfall for each of the 5km squares over the Peak District was worked out. This data was used to help model the climate scenario maps. On each map the high and low differences refer to high and low emissions of carbon into the atmosphere.

> **Summer average temperature maps**
> **Winter average rainfall maps**

> **Summer average rainfall maps**
> **Winter average temperature maps**

Temperature maps

It is predicted that there will be minimal change in either annual or seasonal average temperature by the 2020s, even under the high emissions scenario. This is because the change in climate over the next 30–40 years has already been determined by historic emissions, and also due to the inertia in the climate system. Annual and seasonal change becomes much more evident by the 2050s.

Possible summer average maximum temperature

1961–1990 average = 17.5°C
2020s both low and high carbon emissions scenarios = 19.5°C
2080s low carbon emissions scenario = 20.5°C
2080s high carbon emissions scenario = 23°C

Possible winter average maximum temperature

1961–1990 average = 0.5°C
2020s low carbon emissions = 0.5°C
2080s low carbon emissions = 1.8°C
2080s high carbon emissions = 3°C

Rainfall

The climate scenarios show little change (or a slight decrease) in the predicted annual average rainfall, but this masks a significant change in the seasonality and distribution of future rainfall. As the winters become wetter and the summers become drier, there will be a greater contrast between summer and winter seasons.

Possible summer average rainfall

Decrease of up to 45% on average by the 2080s high emissions scenario
1961–1990 average = 246mm
2020s low and high scenarios = 9–11% reduction
2080s low scenario = 23% reduction
2080s high scenario = 45% reduction

Possible winter average rainfall

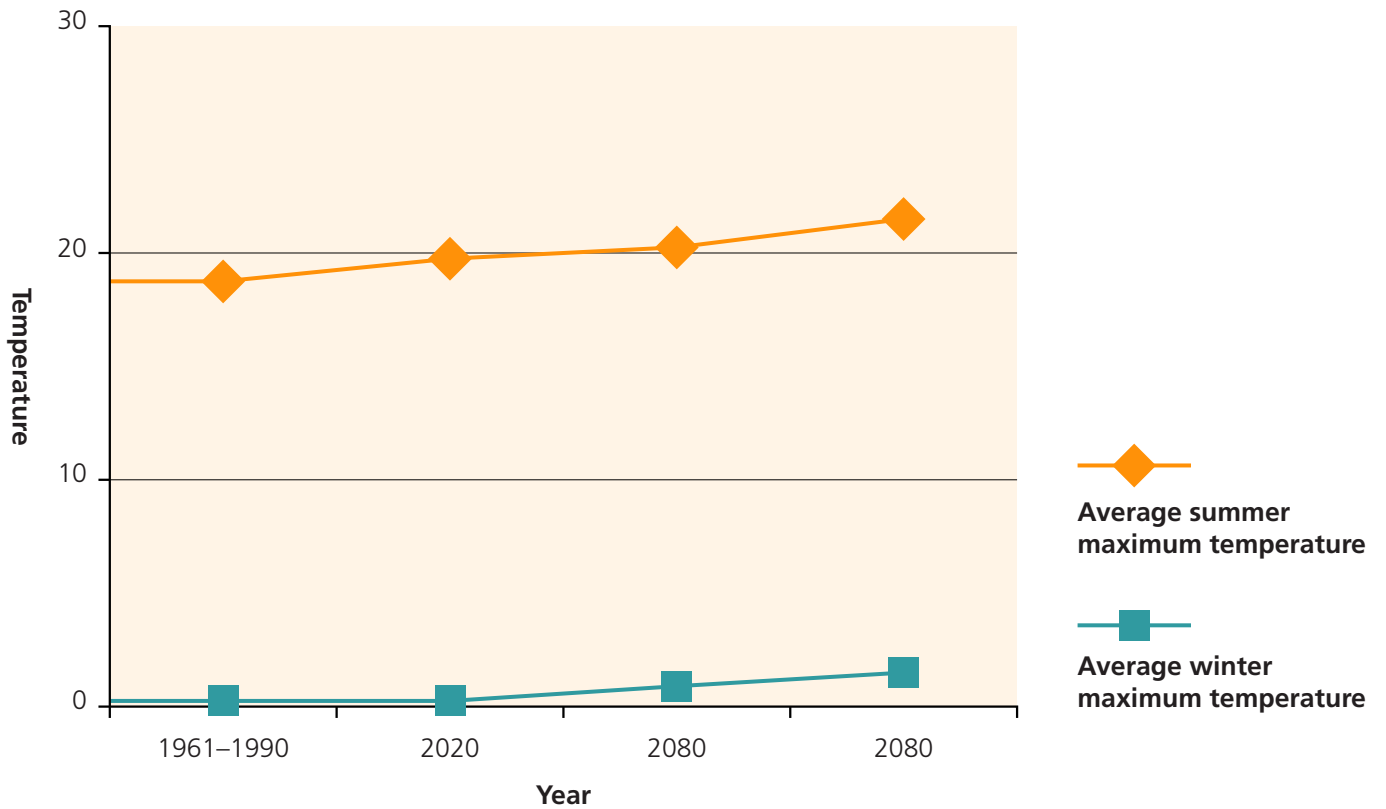
1961–1990 average = 325mm of rainfall
2020s both low and high carbon emissions = 330mm of rainfall
2080s low carbon emissions = 375mm of rainfall
2080s high carbon emissions = 485mm of rainfall

Note: Some changes will have already occurred since the baseline 1961–1990 average climate.



Climate Scenarios for the Peak District – continued

Possible temperature changes in the Peak District National Park

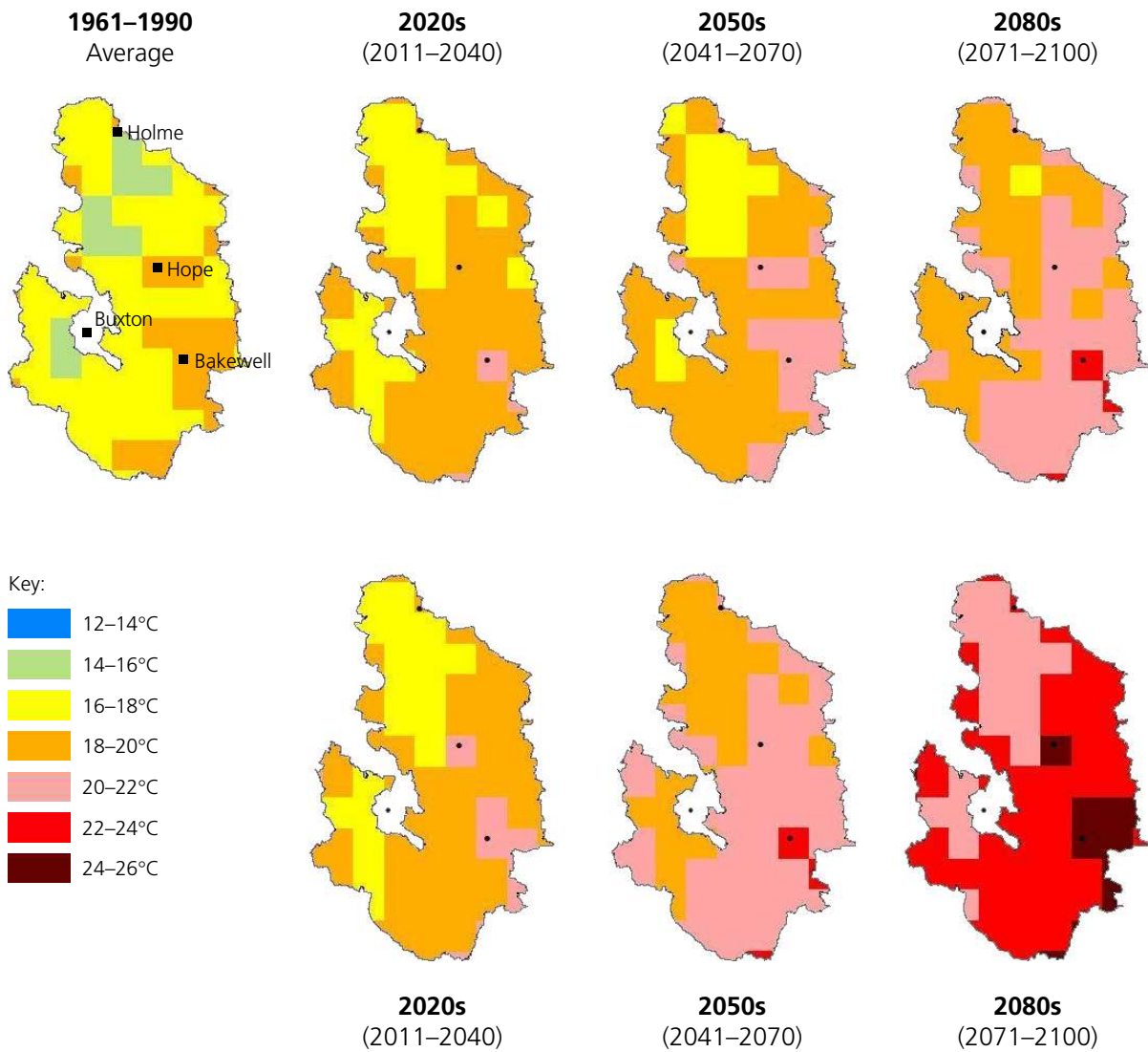


	1961-1990	2020 low and	2080 low carbon	2020 high carbon
Average summer maximum teperature	17.5	19.5	20.5	23
Average winter maximum teperature	0.5	0.5	1.8	3



Summer – Average Temperature Maps

Low

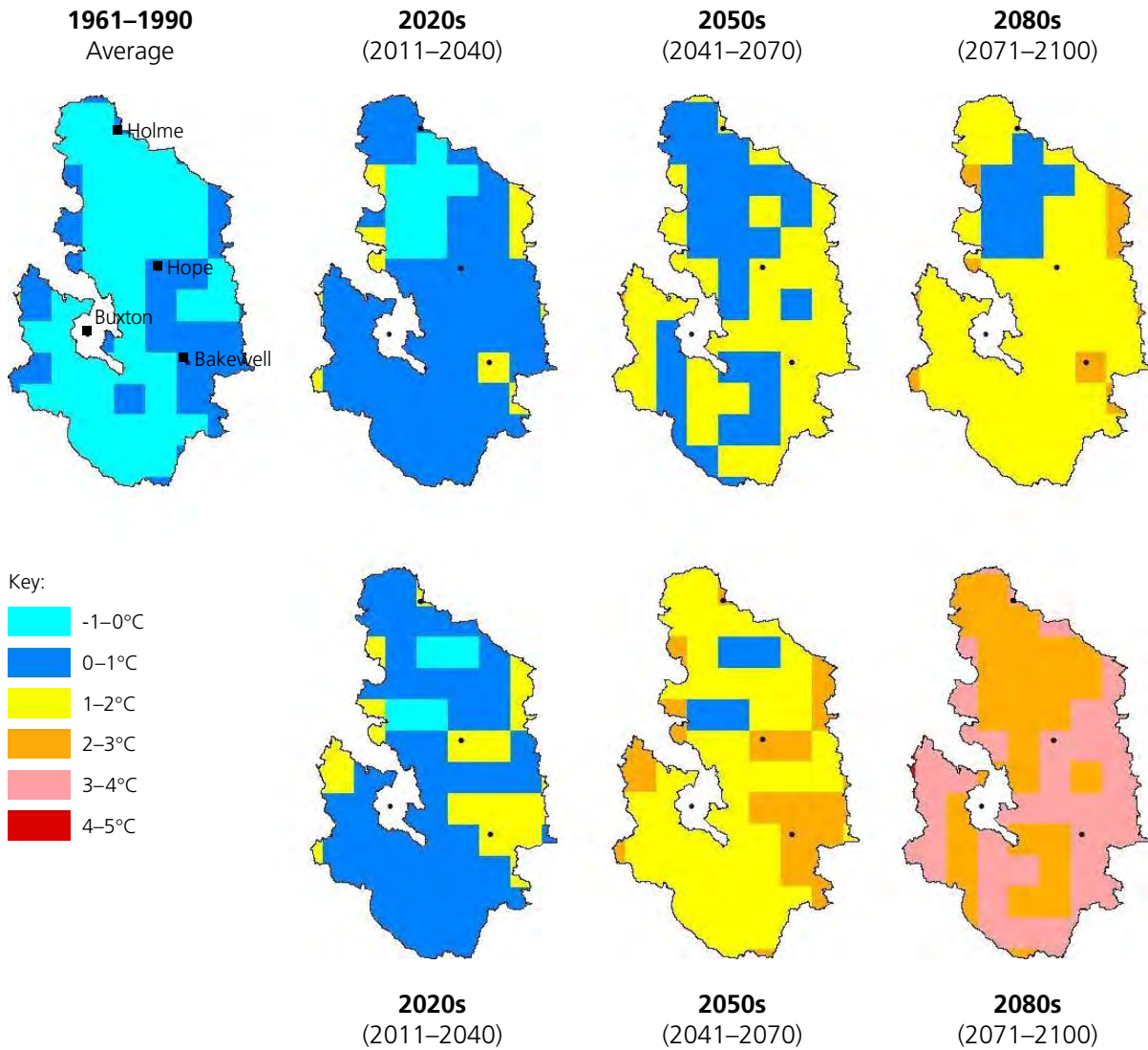


High



Winter – Average Temperature Maps

Low

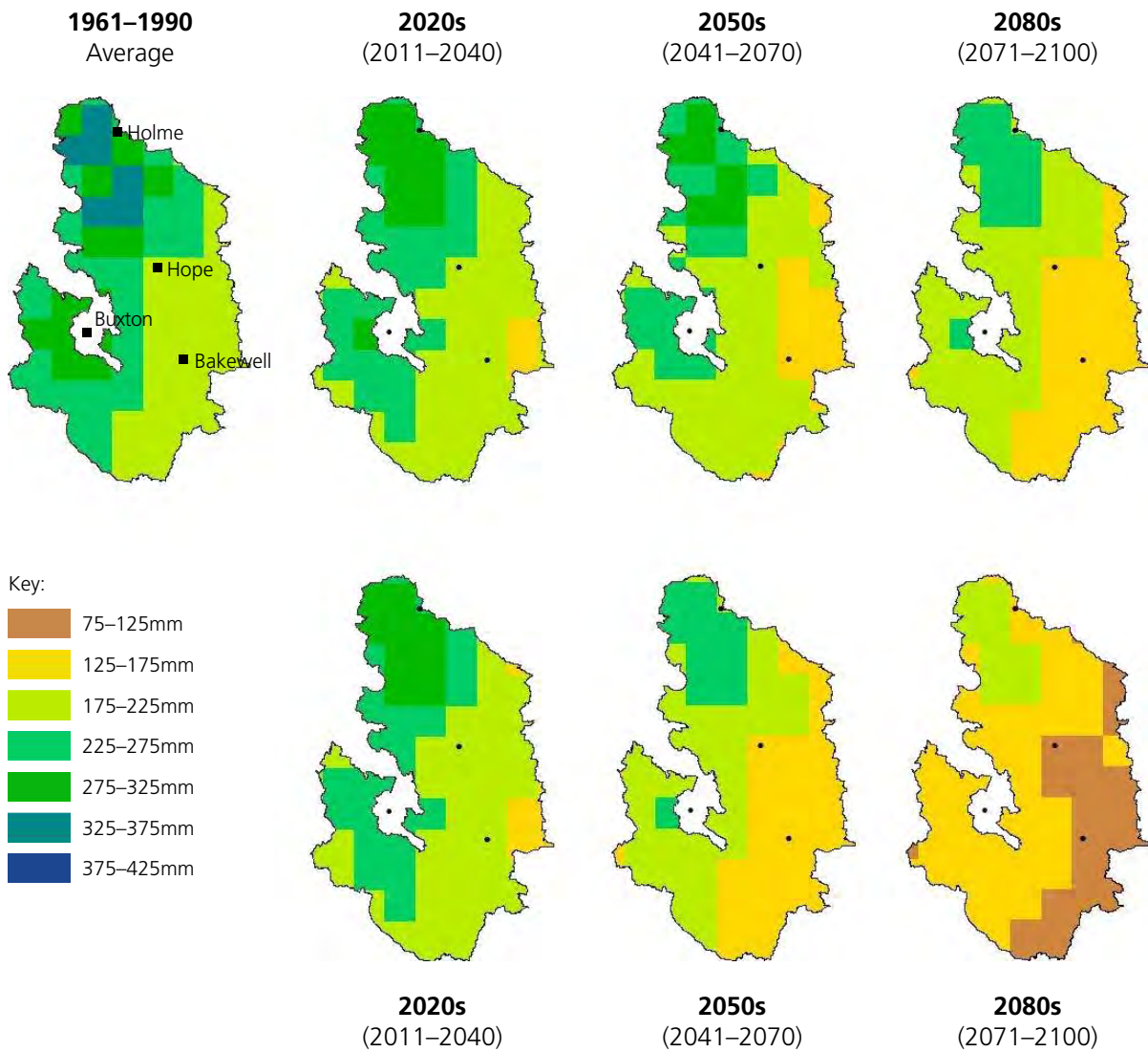


High



Summer – Average Rainfall Maps

Low

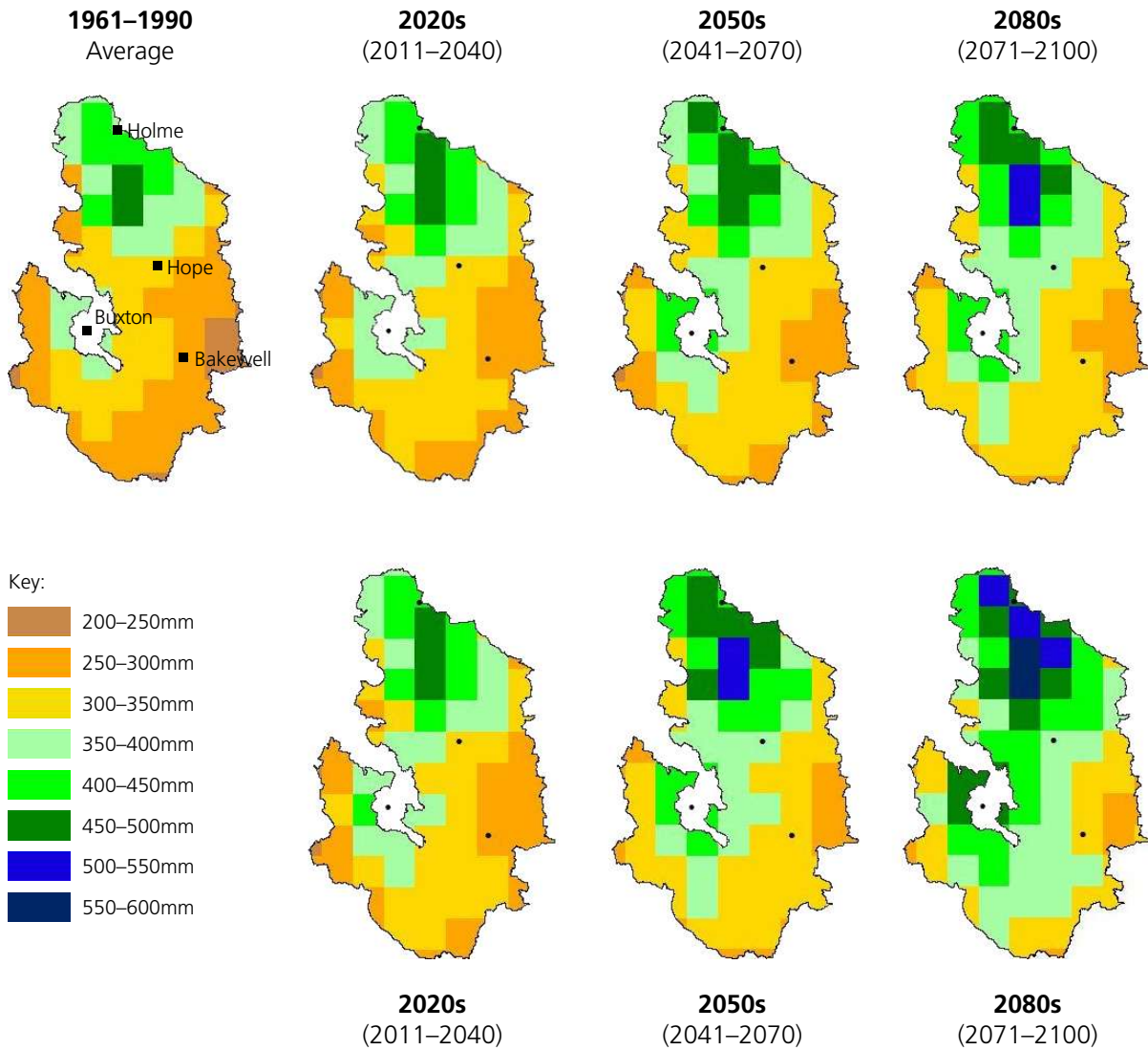


High



Winter – Average Rainfall Maps

Low



High

8

MOORLAND DISCOVERY

Climate Change Activities



National Curriculum links

This section has activities for KS1, KS2, KS3 and KS4

Activities

CAUSE AND EFFECT

OPINION LINE

ECO-BOARD GAME

HOW ENVIRONMENTALLY-FREINDLY ARE YOU?

These activities are relevant education for Sustainable Development across the curriculum as climate change issues are part of our everyday lives.

Reinforce reasons for reuse, recycle, reduce.

Packed lunches for a school visit – how can pupils both reduce waste and bring a healthy lunch?

Look at questions on eco-game cards and discuss why each of these things are important.

Become an eco-school – check the Eco-Schools website: www.eco-schools.org.uk

Thinking and discussion skills.

Cause and Effect

1. Give a situation, e.g. the moorland hare has disappeared from the Peak District or the reservoirs are empty.
2. In groups of about three, think of three reasons why this might have happened and three possible effects of this happening.
3. You can think of all sorts of other situations to discuss!

Opinion Line

1. Stretch out a long line of string. Ask pupils to stand at a chosen point on the string depending on what their opinion is on a specific statement, with one end standing for 'This is a very good thing' and the other end standing for 'This is a very bad thing.'

Statement example: New species will begin to appear in the Peak District, moving up from southern climes.

2. Each pupil has to explain why they have decided to stand in the place they have chosen.
3. Very easy bar charts could be drawn from this exercise.
4. You could try the activity at the beginning and end of a topic, to see if their opinions have changed.
5. Use this also for aspects of **Moorland Management** and **Recreation**.

Eco-Game Board

1. Numbered board needed with pictures of moorland birds, plants and animals interspersed with numbers.
2. Players throw dice, move along board and if they land on a picture they pick up a card and answer the question on the card. This will tell them where to move next.
3. The winner is the first to reach the end of the numbers.

8

MOORLAND DISCOVERY

Climate Change Activities



How Environmentally-Friendly are You?

Board game

Print and stick together the two halves of the eco-board game on [page 109 \(part 1\)](#) and [page 110 \(part 2\)](#) and also the cut-out game cards (featured below and on [page 106](#), [page 107](#) and [page 108](#)). Players can make their own game pieces from recycled materials, such as bottle tops – instructions below.

How to play:

Each player takes a counter and takes it in turn to roll the dice.

Moving up the board from the START, move the number of places rolled.

If a player lands on a place occupied by a moorland animal or plant they pick up a card, answer the question on the card, then follow the instructions.

The first player to reach the end is the winner and the most environmentally-friendly!



> Eco-board (part 1) and (part 2)

Game cards

Have you got a compost bin?

Yes – well done! Move on 2 places

No – get composting, miss a go

Do you recycle paper?

Yes – excellent, move on 2 places

No – not so good, move back 2

Are you in an Eco-club?

Yes – fantastic! Move on 4 places

No – join one, stay where you are

Do you switch off lights after you've used them?

Yes – excellent, move on 2 places

No – oh dear, move back 2 places



How Environmentally-Friendly are You? – continued

Do you have a bath or shower?

Bath – not so environmentally friendly, stay where you are

Shower – saves water, move on one place

Do you leave the television on standby?

Yes – oh dear, move back one place

No – excellent, move on one place

Do you have the heating on all the time?

Yes – oh dear, move back 2 places

No – good, you've got the right idea, roll again

Do you use recycled toilet paper?

Yes – great, every little thing helps. Move on one place

No – move back 2 places

Do you drop litter in the street or park?

Yes – that's not very nice, miss a go

No – good, move on 2 places

Do you wash your pots by hand or use a dishwasher?

By hand – that's better for the environment, move on 2 places

Dishwasher – not so good for the environment, move back 2

Have you ever grown a plant or tree?

Yes – brilliant – roll again!

No – why not try it? Miss a go

Do you recycle glass bottles?

Yes – good, roll again!

No – oh dear, move back 2 places



How Environmentally-Friendly are You? – continued

Do you eat organic food?

Yes – tasty! Move on 3 places

No – try it, you might like it – move back one place

Do you love wildlife?

Yes – so do I! Move on 2 places

No – oh dear, miss a go

Do you leave the tap running while cleaning your teeth?

No – excellent, move on one place

Yes – oh dear, move back one place

Do you walk to school?

Yes – much better for the environment, roll again

No – cars are polluters, move back one

Do you recycle your rubbish?

Yes – well done! Move on 4 places

No – get re-cycling! Miss a go

Do you use energy-saving light bulbs at home?

Yes – excellent! Move on 3

No – not so good, move back 3

Does your class leave the light on unnecessarily?

Yes – oops, miss a go

No – well done! Move on 4 places

Do you buy recycled paper?

Yes – great, move on one place

No – better luck next time, move back one place

8

Climate Change Activities



How Environmentally-Friendly are You? – continued

Do you feed birds in your garden?

Yes – that's great, move on 3 places

No – birds go hungry – miss a go

On a nice sunny day, what would you rather do?

Play outside – move on 2

Play on the computer – move back 3

Do you have more than 3 bits of rubbish in your lunch box?

Yes – move back 3

No – very good, move forward 2

Do you reuse your drinks bottle?

Yes – fantastic! Role again

No – oh dear, miss a go

How do you keep warm in the winter?

Put on extra clothes – great, move on 4



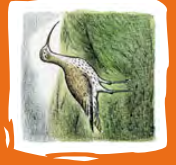




Turn the heating up – not so good, move back 3

Do you keep your classroom warm?

Yes – by closing the doors to keep in heat. Great move on 2 places

No – the doors and windows are left open. Miss a go

HOW ENVIRONMENTALLY FRIENDLY ARE YOU?

60	61	62	63	64	WELL DONE!
59	 58	57	 63	55	 54
 48	49	 50	51	52	53
47	46	45	 44	43	42
36	 37	38	39	40	41

35	34	33	32	31	 30
24	 25	26	27	28	29
 23	22	21	 20	19	18
12	13	14	15	16	 17
11	 10	9	 8	7	6
START	1	2	3	 4	5



The History of the Moorland

History time line

Time	People	Changes	Climate
10,000 BC	Mesolithic people Hunter-gatherers	Start of moorland burning and clearance	Warm and dry
4,000 BC	Neolithic people Scattered settlements	Start of farming Increased deforestation	Warmer and increased rainfall
2,000 BC	Bronze Age people	Invention of the wheel	Drier and a more continental climate
800 BC	Iron Age people	Increase in woodland clearance	Cooler and wetter
0 AD	Romans – dispersed farms and hamlets	Field systems and Roman roads	
400 AD	Medieval people	Peat cutting and the start of the millstone industry	
1,500 AD	Tenants and landowners	Farmhouses and villages built in stone	
1,800 AD	Victorians	Management for grouse shooting	
1,900 AD	First and Second World Wars	Management for conservation & recreation	
Now and the future	You, your children, your children's children	Biodiversity action plans	



A Brief History of the Peak District Moorland Areas

Mesolithic people were hunter-gatherers who moved with the seasons and the animals they hunted. The last population of Tarpan (primitive horses) roamed the Peak District and were hunted by the Mesolithic people. During this time the world was warmer and drier, which meant that the upland areas were warmer and a nicer place to live. These areas looked very different covered with shrubs and deciduous woodland which made them ideal places to live. During this period man started to cut down some of the trees and burn areas which made clearings in the woodlands; this created open grassy areas which attracted wildlife. This in turn made hunting easier for these early settlers.

Neolithic people started to build settlements on the uplands; these were scattered across the area. These people had an advanced culture and started to build many features which still shape the moorlands. Henges and enclosures such as Arbor Low are examples of these. Other examples are the many stone circles, cairns, barrows and even rock art which can still be found across the Peak District. This was a time of change for the moorland environment, with the start of farming and the creation of fields. During this period the deforestation of the high upland areas continued, the climate was warmer with higher rainfall, so it was a more oceanic climate. This, combined with the deforestation, altered the environment, which started the formation of peat.



Bronze Age and the Iron Age. During these periods the uplands stayed very similar as through the Neolithic period, with more settled communities establishing farms and managing the landscape. During this period the Iron Age hill forts such as Mann Tor and Castle Naze were being built. The climate became drier and more continental during the Bronze Age but by the end of the Iron Age it had started to become cooler and wetter, much like the climate we see today on the moorland.

Late-Bronze Age people and roundhouse living on the open Peak District moorland

The Romans had a large impact on the Peak District with the introduction of Roman roads which crossed the moorland. The occupation of the Peak District was valuable to the Romans for a number of reasons: to secure the lead mines the area was known for, to secure the area to the rear of the advancing army as they moved north and to control the valuable trade route which ran east to west across the peaks. The Romans secured their hold of this area with a number of forts, one of which was at Brough in the Hope Valley. During the period of Roman occupation the Peak District became a more affluent area. The local population prospered, with increased trade and much of the area given over to farming to supply the garrisons. The lead mines of the limestone plateau also became more important; with the lead being traded across the country, it became an important source of wealth.

Through the end of the Iron Age and the arrival of the Romans the change to a cooler and wetter climate meant that many moorland farms and fields were abandoned. People moved from these exposed areas and resettled in the more sheltered valleys. As the moorlands were abandoned the plants we see today established themselves in the new wetter climate. Continued sheep grazing meant that trees could not re-grow and the moorland as we see it today started to take shape.



A Brief History of the Peak District Moorland Areas – continued

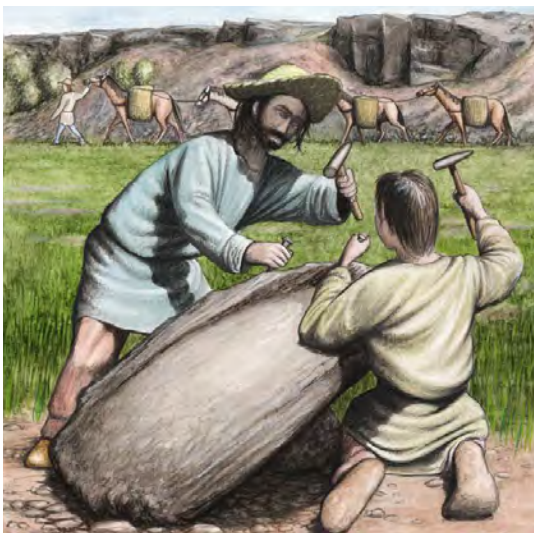
The Medieval period was a period of change and industry on the moorland. Today, when we look at the moorlands, we see an area of natural beauty; however during the Medieval period they would have been a busy bustling place of trade and mining. Trade had increased during the Roman occupation and by the Medieval period there were well-established packhorse routes and holloways which criss-crossed the moorland. The packhorses, with saddle bags filled with salt from Cheshire or wool and quarried stone, crossed the moorland on narrow paths which can still be seen to day.



Farming on the Longshaw Estate during the Medieval period

Examples of these can be seen right across the moorland but the packhorse bridge in the Burbage Valley is a good example. During this period people started peat cutting to provide fuel for cooking and heating their homes, as well as establishing common land for grazing.

The Royal Forest of the Peak and other private forests and deer parks were established. These were private hunting areas for the King and other landlords, which covered large areas of the moorland and the White Peak. At this time the Peak District would have been mostly deforested on the high plateaux but the lower slopes and valleys would have still been semi-wooded. These were the areas where the King would have hunted for deer, wild boar, hares and grouse.



Medieval stonemasons cutting a millstone

Millstone quarrying started during the Medieval period and continued right up to the mid-20th century. This was a major industry in the moorland areas and the quarries and abandoned millstones can still be found today. The millstones were cut from the gritstone edge by stonemasons, who produced up to 12 pairs of millstones a year. The early stones were dome-shaped on the top, while the later ones were flat on both sides. The average size was approximately five feet in diameter and over a ton in weight. These millstones were used for milling oats, barley, peas and beans or as crushing stones in mines or paper mills. They were not often used for milling wheat as the stone affected the colour of the flour. These stones were sold all over the world by the end of the 19th century; however, the industry collapsed overnight with the Industrial Revolution and changes in industry.



A Brief History of the Peak District Moorland Areas – continued

The Victorian period saw the start of the management of the moorland for grouse shooting. This was a sport of the landed gentry who owned large areas of the moorland. This meant these areas became out of bounds for ordinary people. The moorland started to look as we see it today, with the distinctive stripes in the heather where the gamekeepers, employed by the landlords to manage the land, burnt strips to encourage the grouse to breed.

During the **First and Second World Wars** the Peak District moorland areas were heavily used as a training ground for troops. When you are walking in the Peak District if you look closely at the boulders and cliffs you might spot round depressions in the rock. These are not natural erosion; these small circular depressions are scars from bullets when they were used for target practice. The moorland areas were also used to deflect air raid attacks on Manchester and Sheffield. When the cities were in blackout lights were lit in the moorlands outside the cities to confuse the enemy pilots.



Fires lit on open moorland during World War 2

After the wars ended people wanted to enjoy life and escape the cities, but when they got out into the countryside they found they couldn't get up on the high moorland areas. Many young people who wanted to enjoy the countryside found that the land was owned by a handful of landlords for grouse shooting. This led to the Kinder Mass Trespass in 1932; an organized protest by walking groups from Sheffield, Manchester and other surrounding areas, to try and gain access to the moorlands. This protest, and others like it, raised the profile of access to the countryside and led to the 1949 National Parks and Access to the Countryside Act. This resulted in the creation of the National Parks, of which the Peak District National Park was the first in 1951.

Now and the future

Since the creation of the Peak District National Park the moorland areas have been managed for conservation, farming and recreation. There are still grouse shooting moors and this is a traditional and integral part of the management of the moors. Many thousands of people enjoy visiting the Peak District moorland areas for cycling, climbing, walking, sight-seeing, paragliding and much more.

Work is now being carried out monitoring, researching and restoring this valuable and rare habitat. With the possible effects of climate change our moorland areas may become more vulnerable. They may become more at risk from lower levels of rainfall and hotter summers, increasing the risk of moorland fires.



National Curriculum links

Literacy KS2 Creating and Shaping Texts

Activities

CREATING YOUR OWN MOORLAND LEGENDS

PLACE NAME GAME

Creating Your Own Moorland Legends

Can you use these stories and legends to make up your own? What kind of adventures did the highwaymen of the moors get up to? Is there a mermaid? See if you can make a new legend for our historical figures. For more fun and facts about the history of the Peak District visit: www.peak-experience.org.uk and look for the bloody peak.

The mermaid of Kinder Pool

If you climb up Kinder Scout visit the immortal mermaid in the bottomless Mermaid's Pool. She is said to rise from the deep pool on Easter Eve and she can reward those visitors who spot her with the gift of long life. However it is thought that the mermaid is just as likely to take a dislike to her admirers and draw them down into the depths to meet their doom, as to give them immortal life. The pool is believed to have a mystical link with the Atlantic Ocean so the water is unfit for freshwater fish or for animals to drink.

Highwayman – Bold Nevison

Grindleford Bridge is connected to a very famous highwayman of the moorland packhorse routes. He was famous for robbing travellers in the Hope Valley during the reign of Charles II. He was called 'Bold Nevison' or 'Swift Nick Nevison'. Nevison was a Robin Hood type figure, he asked for money from rich people and gave most of it to the poor. One tale says he met a Padley farmer, who had just sold some cattle at Bakewell market to pay his rent. They had a drink together and 'coincidentally' went the same way home. On the way Bold Nevison drew his pistol and demanded the farmer's money. The farmer pleaded that if he didn't pay the rent, his family would be made homeless. Bold Nevison took his money and galloped off. The farmer then heard two shots from Grindleford bridge, which was guarded by a night watchman. He then heard hoof beats and breaking glass. Below a smashed window the farmer found a bag containing the stolen money and an extra guinea! Swift Nick was never seen again.

Place Name Game

You could also try making up a story as to how a moorland place got its name. Here are some interesting moorland place names to start you off!

MADWOMAN'S STONES	JACOB'S LADDER	MOTHER'S CAP
FEATHERBED MOSS	EAGLE STONE FLAT	EAGLE STONE FLAT
LOST LAD	GIBBET EDGE	

Look on an OS map of the Peak District for more fascinating moorland names.