



Peat in the Peak: Peat in Trouble

Recognise that environments can change and some face threats

KS1/2: Teachers Information and Worksheets

Content	
Page 2	Introduction - Including overview, curriculum links and learning objectives
Page 3 - 7	Teachers notes to support presentation slides
Page 8 - 10	Supporting worksheets Don't forget we would love to see examples of any work your students create in these lessons, share examples with us. There are lots of easy ways to share back with the Peak District National Park: <ul style="list-style-type: none">• Twitter: @peakdistrict• Facebook: facebook.com/peakdistrictnationalpark• #PDNPSchools #PeakDistrictProud• Email us: ambassadorschools@peakdistrict.gov.uk (letter, photos of art work, poems etc.)



Introduction

Learning objective

To understand that peatlands are under threat, mostly due to human influence, and that this causes wider problems for the ecosystem including ourselves.

Curriculum link

Science:

- Living things and their habitats

Geography:

- Comparing an area of the UK with that of another country
- Describe and understand key aspects of physical and human geography

Art:

- Develop practical art skills (Activity 3)

Wider links:

Cultural capital – National Parks and the wider countryside of the UK is a valued cultural asset that millions can enjoy and get benefits from.

UN Sustainable Development Goals: 15 Life on land: Protect Biodiversity and Natural Habitats

Overview

This is our second lesson in the Peat in the Peak series which will provide the opportunity to explore the effects human activities can have on a habitat and understand that this can have knock-on effects to the wider ecosystem.

If you haven't already, we would recommend completing our first lesson in the series 'Peat in the Peak: Why is Peat Special?'. It gives an introduction to what peat is and why it's important, providing base knowledge before moving onto this lesson. You can download a [Peat in the Peak Summary sheet](#) here if you haven't already started using this.

Many habitats are facing threats causing their destruction or degradation and peatlands are no exception. Unfortunately, most of these threats are directly or indirectly due to humans. Anything from people walking through the vegetation to using peat compost can cause harm to peatland habitats. At the end of this lesson students are encouraged to discuss whether the degradation caused by the various human activities are worth the benefits we gain and if there are any alternatives.

In the notes you will find questions in **bold** with an answer in *italics*. These are suggested questions/discussion points based on the slide to help develop the students understanding of the topic.

NB: Where You Tube video links are provided it is advised that you load these videos up before your lesson, this means you can skip through adverts in advance and have them on full screen as you cannot control the suggested links that appear outside your video.

Presentation Slides

Slide 3

Key vocabulary

Key Vocabulary

- **Degraded** – In a bad or broken state
- **Vegetation** – a large group of plants growing together
- **Eroded** – worn away by wind, water and human activity
- **Replenish** – fill something up again



Slides 4-8

Recap of 'Why is Peat Special?' lesson with the final activity from that lesson.

You might find [this resource](#) from the IUCN peatland programme useful to summarise lots of these areas.

Recap - Why is peat special?

Give 4 reasons why we should look after peat soil

- Peat is a rare type of soil so what is left needs protecting
- It is home to lots of wildlife, some of which can only be found on peat soil
- Healthy peatlands are a carbon sink, storing lots of carbon!
- Healthy peat helps to reduce flooding in nearby towns


In the last lesson we found out that the British Isles holds 10-15% of the world's peatlands, a substantial amount. In the UK only 20% is undamaged! While we can't directly compare the two facts due to one being about the British Isles and one about the UK, we can still see that a large amount of this important habitat isn't healthy and much of the peat across the Republic of Ireland is likewise damaged.

Peat in trouble

Across the globe 25% of peatland has been destroyed

In the UK, 80% of peatland is damaged

10 million tonnes of carbon dioxide are being released into the atmosphere from peatlands in the UK each year through human activity





Peat in trouble

This is the second section of the **Peat in the Peak Summary Worksheet** found in the Ambassador Schools resources section of the website.

Peat in trouble

- The following slides will show threats to peat in the Peak District.
- Each threat **degrades** the peatland by REMOVING it or EXPOSING it.

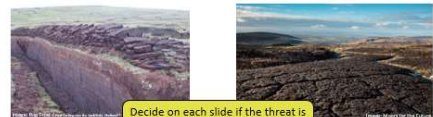
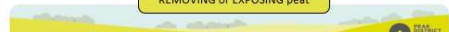
Each threat will give a prompt for the class to decide if the threat is Removing or Exposing peat. The two are not explained again after this slide so ensure the class understand the difference.

Peat in trouble

REMOVING peat – the peat is taken away and used somewhere else

EXPOSING peat – The living layer of **vegetation** is removed leaving the peat bare

Decide on each slide if the threat is REMOVING or EXPOSING peat

Slides 9-16

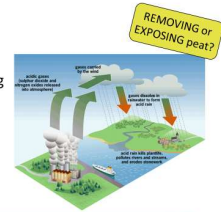
Sphagnum moss was killed due to the high acidity rainfall. This is a really important plant for forming peat soil. It helps keep the ground wet which, if you cast your mind back to last lesson, is important as waterlogged conditions are needed for peat formation.

Note: Burning fossil fuel in cars, lorries, trains and planes as well as industry causes Acid Rain: Acid rain is less of a problem in UK now many 'dirty' industries have closed down.

Removing or exposing peat? *Exposing*

Acid rain

- The Industrial Revolution caused an increase in acid rain by burning fossil fuels for energy
- The acid rain killed lots of the sphagnum moss in the Peak District, leaving some peat without any **vegetation** growing on it



Burning peat for fuel used to be much more widespread but still commonly occurs around Peat bogs in Ireland and Scotland. Once a year, families harvest enough peat to cook and heat their homes for the following year.

Peat harvesting for fuel is also done on a larger scale by big companies but this is becoming less and less common as new restrictions (such as an effective ban on commercial peat harvesting in Ireland) are brought in.

The practice is slowly being phased out for both personal and commercial use due to its impact on the climate and ecosystem.

Removing or exposing peat? *Removing*

Burning peat for fuel

- Peat burns really well so is good to use as fuel on a fire
- The peat is dug out and then dried to remove all the water so it burns easier.
- For some people it is much cheaper than using oil or gas to heat their home



Sheep – although there is lots of grazing in the uplands and this is an important way of life we have to make sure that areas that are vulnerable are not over grazed with large numbers of livestock.

Removing or exposing peat? *Exposing*

Sheep

- Lots of the Peak District is farmland meaning there are lots of sheep!
- Sheep eat the vegetation meaning the moorland loses lots of important and/or rare plants and grass starts to take over
- Some of these plants help keep peat healthy



A metre cubed of peat contains around 100kg of carbon which would be released into the atmosphere when burned.

How long would it take a metre of peat to build up?
1000 years!

Burning peat for fuel

- Fires take a lot of fuel with a family easily using a metre cubed of peat in a month or less – this is around a tonne of peat!

How long would it take a metre of peat to build back up? (replenish)

Hint: It takes 1 year for 1mm of peat to build up....



Slides 9-16

While we want everyone to be able to experience the Peak District National Park, large numbers of visitors can bring problems. By walking through vegetation they can cause damage and erosion meaning areas of bare soil develop.

Paths often get wider as people walk in large groups or walk off the edge of a path to avoid a muddy patch which causes damage to surrounding vegetation.

Removing or exposing peat? *Exposing*

See Activity 1 – Accidental Fire Questions

The first video gives a little background to moorland fires and shows how they can be fought using helicopters. You may want to watch this in advance as it could be quite long for some groups and need skipping in places but it does give some answers to the slides questions.

If the videos don't work the answers to the questions are below and the main points summarised on the next slide:

What can cause fires in the Peak District? *Fires are often caused accidentally by discarded cigarettes and BBQs. Left litter can also start fires (glass bottles and cans can focus the sun onto one point and ignite it).*

Why are fires in the Peak District difficult to put out? *They burn deep into the peat. They are remote and hard to reach. It's expensive. We know peat is used as a fuel as it burns well.*

What damage do fires cause? *Burn vegetation. Burn deep into peat preventing plants from growing back. They might hurt animals directly or through the smoke.*

As we've already learnt, peat burns very well which is why it's used as a fuel. This makes fires on moorland difficult to control! It's made even harder due to the fire sometimes spreading underground through the peat. Not only does this damage the peat, it also means the fire may pop up in other places.

Removing or exposing peat? *A bit of both (the peat being combusted is being removed)*

Visitors

- The Peak District is very popular with lots of people coming to visit it.
- When people walk through **vegetation**, they trample and damage it eventually leading to bare ground.



REMOVING or EXPOSING peat?

Photo: Gary Davis, Mind of Mountains



Accidental fires



Watch the videos and answer the following questions:

What can cause fires in the Peak District?

Why are fires in the Peak District difficult to put out?

What damage do fires cause?



Accidental fires

- Fires usually start accidentally on moorlands
- Peat burns very well so the fires often cover large areas making it difficult to put them out
- The fires destroy the **vegetation**



REMOVING or EXPOSING peat?



Slides 9-16

Peat soil is great for gardening as it holds water well. But to be used for gardening the peat has to be taken from somewhere. When the peat is extracted it is exposed to the air and releases CO₂. This happens both in the peat taken away and the newly exposed peat left behind. It's also very damaging to the habitat. Before extraction, the peat must first be drained, destroying any bogs, and vegetation will be removed. The Wildlife Trusts estimate that up to 31 million tonnes of CO₂ have been released in the UK since 1990 through gardening peat use! See [Wildlife Trust](#) report here.

Gardening

- Peat is used in compost for gardening
- This has meant lots of peat is taken from peat bogs to use in compost
- Peat is being used up faster than it can be **replenished**
- The extracted peat releases CO₂!



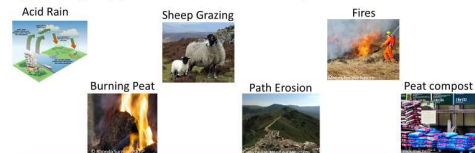
Slides 17-18

Hopefully you will have 4/5 per group but if you have a large class you may want to have some extra groups covering the same threats so that everyone has chance to speak within a group.

Acid rain is a more difficult threat to discuss as it isn't as big a problem in the UK now as industry has died down. Instead we are trying to fix the issues by making the soil less acidic. You may want to leave this threat out or ask children to think about other countries which are currently going through their own industrial revolutions.

Do you think any of these threats are avoidable?

Split into 6 groups, one for each of the threats to peat.



The aim of this exercise is for the groups to discuss and come to understand how it's not as easy as just stopping the threats as in a lot of cases we gain something and the damaged peat is a consequence of that. Some threats are easier to 'solve' than others.

Fires for example often occur due to people enjoying having a BBQ and not being educated on the risks. This is easier to solve (people having BBQs in safe places) than sheep grazing where people earn a living by keeping sheep as they sell their wool for making clothes, meat for food and milk for drinking and making cheese.

Activity 2 is a worksheet for the group/individuals to write their answers in and provides some extra prompting questions to help with students' discussions.

Do you think any of these threats are avoidable?

In your group answer the following questions:

- Why does your threat happen?
 - Hint: Do humans benefit by causing damage to the peat in this way?
- Do you think your threat is avoidable?
 - Hint: Could we get the same benefit in a different way that causes no/less damage to the peat?



Slides 19-20

What happens if peat is damaged?

See Peat in the Peaks Summary worksheet– This is the third section of this worksheet

Curlew pictured.

What happens if peat is damaged?

- The carbon that was stored in the peat is released into the air which speeds up climate change



- Lots of special plants and animals lose their habitats



What is a reservoir? *Pictured on the slide, they look like large lakes but they were made by humans for water storage, by putting a dam in the river to stop most of the water going past.*

Why do we make reservoirs? *Reservoirs in the Peak District provide water for surrounding towns and cities. If the students have water with them from a tap it probably comes from a Peak District reservoir.*

Does the water we get from reservoirs look dirty? *No, it was cleaned before it got to you but the dirtier the water is with peat, the more it costs to clean it.*

Flooding increases due to water running over damaged, bare peat rather than being slowed down by it, and the plants growing on it, as shown 'Why is peat special' the first lesson in the series.

What happens if peat is damaged?

- Eroded peat breaks down into small grains called silt, mixes with water in streams and rivers and goes into the reservoirs. It is expensive to clean the water to make it suitable for drinking.



- Flooding in nearby towns will increase

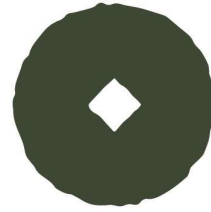


Slides 21-23

Create your own quiz!

- Discuss in pairs what you have found out in today's lesson
- Write down 2 quiz questions and their answers
- Give your quiz questions back to your teacher
- Your teacher will ask a few questions now and save a few for the start of the next Peat on the Peak lesson!



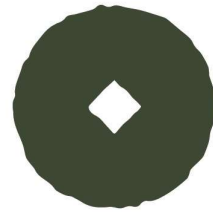


Worksheets

Activity 1 – Accidental Fire Questions

You will be watching 2 videos about accidental fires in the Peak District.

Question	Answer
<p>What can cause fires in the Peak District peatlands?</p>	
<p>Why are fires in the Peak District peatlands difficult to put out?</p>	
<p>What damage do fires cause?</p>	



**PEAK
DISTRICT
NATIONAL
PARK**

Activity 2 – Are these threats avoidable?

Write down the threat your group have been given below and then answer the questions about your threat.

Threat:

**Why does
your threat
happen?**

**Do you think
your threat is
avoidable?**

If you're struggling to answer the questions you may find it helpful to use some of the prompts below. Not all of the prompts will apply to your threat:

Do humans benefit by causing damage to the peat in this way?

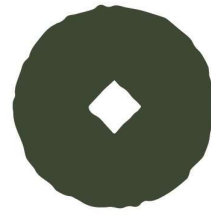
Why do humans keep causing the threat if they know it causes damage to the peat?

Can humans get the same benefit by doing something else?

Could people visiting the Peak District be educated on a better way to behave differently and cause less harm?

Can humans get the same benefit by doing the same thing in a different place?

Would the same damage be caused to a different habitat if your threat was done somewhere else?



Activity 3

Protect the Peat Poster

Design a Poster to tell people one of the threats to peat and how we can help to stop it.