



Peat in the Peak: Why is Peat Special?

Understanding the wider importance of peat soil

KS1/2: Teachers Information and worksheet

Content	
Page 2	Introduction - Including overview, curriculum links and learning objectives
Page 3 – 6	Teachers notes to support presentation slides
Page 7 – 9	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 what peat soil is and that peatlands are a special habitat that provide benefits to the wider ecosystem, including ourselves.

Curriculum links

Science:

- Living things and their habitats
- Working scientifically (Activity 2 or 3)
- Plants (Activity 3)

Geography:

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

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 lesson will provide the opportunity to explore what peat soil is, how it forms and the benefits a healthy peatland provides.

Large areas of the Peak District are covered in a layer of peat soil - it is what much of the uplands in the Peak District are built upon. These peatlands provide many benefits to us as well as the environment as a whole. They are home to specialised species of plants and animals, help prevent flooding, provide space for recreation and fresh air, and store carbon, which slows climate change. Possible activities are provided at the end of this document to help enhance the students learning.

2 additional lessons within this series will cover how peatlands are damaged by environmental change and human activities as well as how they are being protected.

In the notes you will find **questions in bold** with *answers in italics*. These are suggested questions/discussion points based on the slide to help develop 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

- **Decompose** - to rot or break down into its small components
- **Waterlogged** - full of water (saturated)
- **Degraded** - in a bad or broken state
- **Vegetation** - a large group of plants growing together



Slides 4-7

What is peat?

Peat is a type of soil which forms in many wet, upland areas of the UK such as here in the Peak District. It can also form in lowland bogs or fens.

If the soil is rare does this make it more important to protect it? YES. *If it is rare it is easier for it all to disappear as there isn't much of it there to start with.*

What is peat?

Peat is a rare type of soil and is the main reason our moorland is such a special place.



Where deep peat exists, the conditions it formed it are not necessarily the same any longer, this means it is no longer actively being formed there and needs preserving.

The map shows areas where peatlands are still forming.

Areas included are: The Gulf of Alaska, the Gulf of St Lawrence, South Chile/Argentina, Iceland, UK, Norway, Sweden, Central Africa, East Russia, Japan and New Zealand

What is peat?

Peat started forming around 7500 years ago when the world was cooler. Now it only forms in a few places shown on this map



Where are we on the map?

Can you name all the places peat is still forming?

Use a map to help you!



Peatland is a rare habitat type and needs protecting, in the British Isles we have a large proportion of the world's peat (especially considering what a small group of countries we are!)

Why do you think we hear more about protecting tropical rainforests than peatland? *Tropical rainforests are made up of wide expanses of large plants that are easier to monitor and see disappearing, even by satellites from space. We have also been more aware of the loss of them for a long time. Some of the animals that live there have a wider appeal to the public which raises their profile and concern for their habitats.*

Peat is rare!

In the British Isles, we have 10-15% of the world's peatlands.



Peatland covers just 3% of the world's surface

Peat is rarer than tropical rain forest!



Slides 4-7

You can point out the sphagnum moss on the image (green patch on the bottom left corner).

It is important to ensure the class have a good understanding at this point that peat is a **rare** and **slow developing** soil which only forms in specific conditions (when the ground is **waterlogged** and temperatures are **cool**).

Get the children to look at a ruler to see how much 1mm is.
How long would it take to form 10cm? 1m?

If soil takes a long time to be made, does this make protecting what we have even more important? YES – if we remove or damage it, it will take a long time to replenish.

How is peat formed?



Peat only forms at cooler temperatures where the ground is **waterlogged**

In these places plants can't **decompose** fully and instead form peat!

Peat forms at 1mm per year, it's very slow!



Slide 8

Why is peat special?

Why would the Peak District look different without peat?
Each plant has a set of soil conditions it is adapted to grow in. So, if there were a different type of soil we would not get the same vegetation growing there.

The following slides give a few of the reasons why peatlands in the Peak District are so important.

Why is peat so special?

- The Peak District is a beautiful place and wouldn't look the same without the peat soil!
- There are lots of other reasons that peat soil is special which we can explore on the next few slides...



Slide 9-10

Wildlife: Pictured are Little Owl, Green Hairstreak butterfly, Red Grouse, Heather and an Adder.

This is only a small snapshot of the plants, birds, reptiles, mammals, insects, amphibians etc. that live in the Peak District

A lot of the animals and plants can only be found on peatlands, or it's a very important place for them for example during their breeding season.

The Short-eared Owl is amber listed in the UK ([RSPB](#)) meaning they're population number is of 'moderate concern'. So, it's great we have them in the Peak District!

[Sundew](#) is found in isolated parts of the Peak District and is threatened by habitat loss. More info on the [Mountain Hare](#)

Wildlife

Peat soil is home to lots of special plants and animals



Wildlife



This Sundew plant is a **carnivore** and only grows in boggy places (such as on peat soil)



The Peak District is an important habitat for Short-Eared Owls



The Peak District is the only place in England you'll find this Mountain Hare

Slide 11-14

See **Activity 1** – Worksheet with the questions mentioned on the next 4 slides.

Watch the video first. If the video doesn't work the main point is summarised on the next slide and the answers to the questions are below.

What % of peat is carbon? -50%

What happens when peat is bare? – *It becomes a carbon emitter, giving out CO₂ into the atmosphere.*

The main focus on these slides is that when peat forms, it locks up carbon (or CO₂) which slows down climate change.

Explanation if wanted (it might help to look back at slide 7 for a diagram): CO₂ is taken in through photosynthesis of the sphagnum moss that eventually turns into peat when it dies as it cannot decompose fully. CO₂ is given out by the peat when it is exposed to the elements e.g. water running over bare peat washing it off into rivers.

Watch the video first. If the video doesn't work the main point is summarised on the next slide and the answers to the questions are below.

What can happen when lots of rain comes quickly? – *Flooding – also discuss uplands, valleys, how the water can travel quickly to the rivers.*

What happens when rain falls on degraded peat (not much vegetation)? – *Water runs straight off*

What happens when rain falls on healthy peat (lots of vegetation)? – *Water is slowed down reducing the risk of flooding*

Peat and the sphagnum moss growing on it are like a sponge, absorbing a large amount of water. This means in heavy rain less water will flow down the hills and the water that does will do so at a much slower rate. This can prevent rivers bursting their banks, which helps to prevent flooding.

See **Activity 2** – this is a version of what is shown in the video – there is a longer version of some of the examples which you can watch [here](#) if you don't set an experiment up yourself.

Carbon sink

Watch this short video from Moors for the Future and answer the following questions:



Tackling Climate Change

The moor is made of blanket bog

Blanket bogs are worth protecting - tackling climate change - YouTube

What % of peat is carbon?

What happens when peat is bare?

Moors for the Future

Carbon sink

• **'Peat is a carbon sink'** – it takes in and stores a large amount of carbon

• It is thought that peat bogs in the UK store more carbon than all the forests in the UK, France and Germany combined!



Reduce flooding

Watch this short video from Moors for the Future and answer the following questions:



Blanket bogs are worth protecting - Reduce the risk of flooding - YouTube

What can happen when lots of rain comes quickly?

What happens when rain falls on **degraded** peat?

What happens when rain falls on healthy peat?

Moors for the Future

Reduce flooding

• Peat bogs are a type of wetland and very important in the water cycle

• When peat is healthy it is like a sponge and slows down the flow of water

• Peat can help reduce flooding in lowland towns



Slides 15-17

An opportunity to consolidate what has been learned.

Slide 16 summarises the main points made in the slide but of course there are many other possible answers.

Why is peat special?

Work in Pairs: Give 4 reasons that make peat soil special

- 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



This slide contains suggestions of ideas to extend the lesson and for future lessons.

The worksheet was mentioned earlier in these notes and can be found on our website under the title 'Primary School lesson resources - Peat in the Peak':

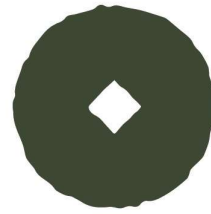
[Ambassador School Resources : Peak District National Park](#)

The activities are at the bottom of this document.

What next?

- Fill in the "Why is peat special?" box on the 'Peat in the Peak' summary worksheet. You can draw or write
- You could do our Spongy Peat and/or Soil and Plants Activities
- Look at our next lesson in the 'Peat in the Peak' series: Peat in Trouble

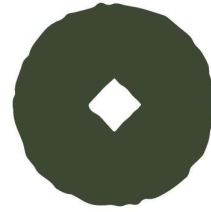




Worksheets

Activity 1 – Video Questions	
You will be watching 2 videos about the benefits of peat soil.	
Question	Answer
What % of peat is carbon?	
What happens when peat is bare?	
What can happen when lots of rain falls quickly?	
What happens when rain falls on degraded peatlands (not much vegetation)?	
What happens when rain falls on healthy peatlands (lots of vegetation)?	





Activity 2 – Spongey Peat – completed as a class

Healthy peatland is really good at absorbing water and this experiment shows what effect that has as rain falls on, and flows down a hill. You will want to do this outside or over a large bucket!

You will need:

- A long waterproof item with sides (e.g. a plastic tray or length of guttering)
- A jug or watering can (to be filled with water)
- Pack of Sponges (or other absorbent material)
- This worksheet and a pencil

Instructions:

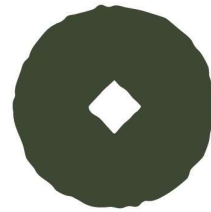
Prop up your tray/guttering so that one end is higher than the other. Make sure it is over an area which can get wet.

- Pour a jug of water (or use a small watering can) from the top of the tray and note your observations
- Place sponges along the length of the tray filling the space as much as possible. A few students may use their hands to hold the sponges in place if needed.
- Pour another jug of water from the top of the tray and note your observations.

Did you notice a difference in how quickly the water reached the bottom of the tray?

	Observations
No Sponges	
Sponges	

Using your findings, think about what would happen to rain falling on a hill with bare peat compared to one with lots of vegetation on the peat. What effect might this have on towns at the bottom of the hill?



Activity 3 – Soil and Plants – completed in small groups

Explore your school grounds or local area to see what effect soil depth has on the number and type of plants you find! See if you notice any differences and why they may happen.

You will need:

- A long sturdy rod/cane (perhaps a garden cane/stake)
- A tape measure or ruler
- This worksheet and a pencil

It would also be useful to have plant ID guides but if not, just describe the different plants you see instead.

Instructions

1. In small groups, choose a spot in the area your teacher has picked out for you
2. At your chosen spot, person 1 pushes the rod into the ground until it feels too tough to push any further (this will mean you have reached the bottom of the soil and have hit a gravel/rocky layer)
3. Person 2 should put their fingers on the rod as close to the ground as possible and pull the rod out of the ground, **DON'T MOVE YOUR FINGERS!**
4. Person 3 should measure from Person 2's fingers to the bottom of the rod in cm. This tells you how deep the soil is (Soil Depth). You can write this in the first column below.
5. As a group, count how many different types of plants you can see within 30cm (you could use a hoop if you have one to put around where your soil depth is measured. Write down the number in the second column. If you can, name or describe the different plants in the last column.
6. Repeat these steps 3 times going to a different place each time. Try to pick areas that look different like the middle of a grassy area and next to a path.

Soil Depth (cm)	Number of different plants	What different plants did you see? (you could sketch them)