

## Getting to know peat – KS2 & KS3

### Overview

<b>Description</b>	This set of notes and resources about peat is designed to help you and your pupils understand what peat is, how it is formed, and why it is a very significant part of the Avalon Marshes. It includes scientific understanding of peat’s formation, the historical significance of peat in the Avalon Marshes, and a debate/discussion activity linked to the issues surrounding peat extraction. Adapt the level of detail and the vocabulary for the level of your pupils.
<b>Time</b>	45 minutes
<b>Curriculum</b>	KS2 - science (rocks and soils; food chains); history (local history) KS3 - science (the carbon cycle); geography (soils); history (local history) English – persuasive writing, report writing.
<b>Aim</b>	Discover what peat is, and why it is a unique type of soil. Find out why peat is important in the Avalon Marshes, in terms of biodiversity, carbon storage, local history, and archaeology.
<b>Learning Outcomes</b>	At the end of this activity all pupils should be able to: <ul style="list-style-type: none"> <li>• Give a short description of peat</li> <li>• Briefly explain how peat is formed</li> <li>• Give an example of why peat is important</li> <li>• Present an argument for or against digging peat</li> </ul>
<b>Linked resources</b>	Introducing the Avalon Marshes <b>Pick &amp; Mix:</b> Avalon Marshes Timeline; Water in the Wetlands; Creative Response to Landscape – Poetry; Avalon Marshes Quiz <b>Factsheets:</b> The Avalon marshes; What is Peat; Water Levels; Flooding and Drought; Land Use <b>Audio</b> - Avalon Marshes, A Peatland Story



## Teachers' notes

Extra information is available on the Avalon Marshes website:

<http://avalonmarshes.org/the-avalon-marshes/landscape/landscape-history/>

<http://avalonmarshes.org/the-avalon-marshes/heritage/peat/>

### **What is peat?**

*What do your pupils already know about peat?*

Peat is a type of soil. *Ask your pupils to give a definition of soil.*

Soil is the upper layer of earth, in which plants grow. It is made up of a mixture of clay, rock particles and sand, and organic matter (the dead remains of plants and animals). The organic matter usually decays, composting down and getting smaller and finer in the process.

Peat is a damp, dark soil that is made of organic matter that hasn't decayed properly.

### **How is peat formed?**

Peat forms in wet environments with high acidity and low oxygen levels – the acidity and lack of oxygen stop the organic materials from decaying. *Ask you pupils why they think that acidity and lack of oxygen affect the decaying process.* The answer is that the organisms (bugs, bacteria, etc) that break down and decay organic matter, need oxygen to live! Many of them also can't live in acidic environments. Therefore it takes a really long time for organic matter to decay in peat bogs.

The Avalon Marshes are in a river valley, and are very low-lying, with stone hills to the north and south and clay underneath. It's like they are at the bottom of a wet basin, and it is the perfect wetland environment for peat to form in. Because peat forms in wetlands, it is made up of wetland plants. *Ask your pupils what plants they think might be involved in the process.*

The partially decayed remains of organic matter like reeds, sedges, mosses and even trees, can be found in peat soils.

A layer of peat acts as a place for plants to grow. When those plants die they form another layer of peat on top. The layers build up over time, eventually forming a slightly raised and domed shape – this is called a 'raised bog'.

### **Digging peat in the Avalon Marshes**

Peat holds lots of carbon, meaning it burns well when it's dry. Before coal arrived in the Avalon Marshes (and a long time before radiators existed!) people put peat on their fires. As early as Roman times, peat was being dug up, dried, and used as fuel in the Avalon Marshes. In the 12<sup>th</sup> century it was the main fuel in the Glastonbury area. People cut peat on their own land, or bought it from peat companies.

A wet mump (large block of peat) weighed 12-13 kg, so digging up the wet peat was very hard work. In 1930s the wage for turving (cutting peat) was 6 shillings a day (30p in today's money!). Three turves were

# Avalon Marshes Landscape



cut out of each mump that was cut and dug up - in a day two men could cut 5000 turves. Turves were stacked in rows called 'windrows' to begin the drying process. They would then be put in 'hyles' - a small stack of 14 turves placed in a very specific way. From hyles the turves went in to small, hollow, bee hive shaped stacks called 'tates'. The final part of the drying process saw the turves put in huge 'ruckles'. They were 3m tall and contained 1000 turves. A ruckle was also a beehive shape, but it was not hollow - on the outside went damper turves, and the driest ones went on the inside. From digging to drying, it took 12 weeks for peat to be ready for fuel. In the 1930s, a peat producer earned £1.00 for every 1000 blocks delivered to customers' doors. *Ask your pupils to imagine being peat workers, and role play the process of cutting, digging and heaving the heavy, sodden peat.* Men cut and dug mumps and turves, whilst women and children stacked the turves into the hyles, tates and ruckles.

Later in the 20<sup>th</sup> Century it was all mechanised, and the peat was no longer used for fuel, but for compost for gardening.

## Peat layers

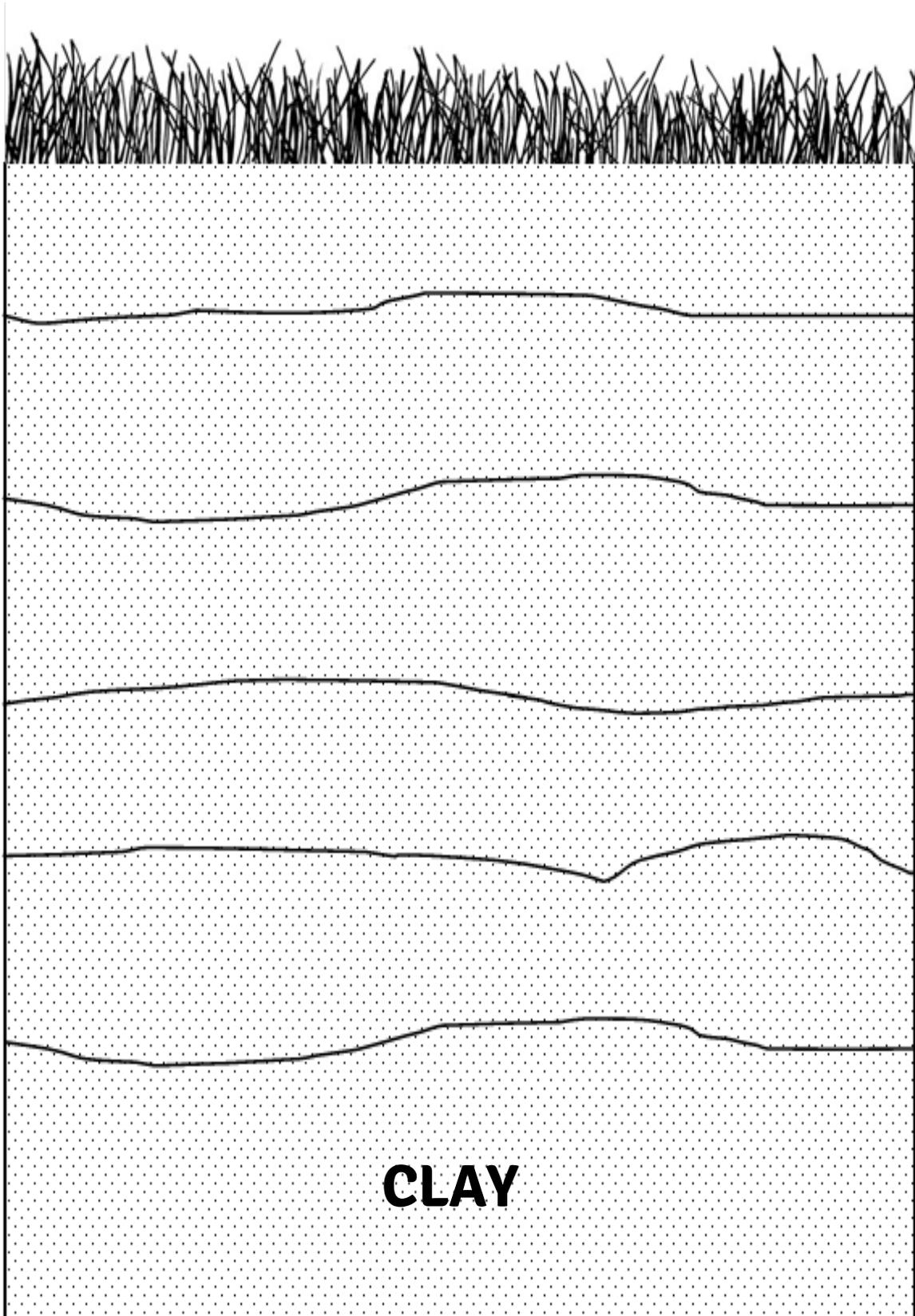
Peat has formed in the Avalon Marshes over thousands of years starting around 6,000 to 7,000 years ago and continuing to about 400 AD. The lowest layers of peat started as reedswamp, then wet woodland and finally huge raised bogs.

The peat diggers in the Avalon Marshes had names for each of the layers of peat that they would dig through. The names reflected the plant life from which they were formed:

Local name	Description	Age?
Peat topsoil	Not a peat at all but rich organic soil	Less than 1,600 years old
Light peat	Mainly formed from <b>sphagnum moss</b> which retains water well	1,600 to 2,000 years old
Best black peat	Somerset " <b>sedge peat</b> " which is dark grey-black. It can be dried into hard blocks for burning and is good garden peat. In most areas this is by far the thickest of the layers	2,000 to 4,000 years old
Fenwood peat	Contains the remains of <b>willow, birch and alder</b> , which grew in wet woodland	4,000 to 5,500 years old
Fen peat	Mainly formed from <b>reeds</b>	5,500 to 6,500 years old

*Print the following page for your pupils to colour and label with the different layers. Ask them to include in each layer the local name for that layer, plus its age and what it is made up of.*

## Avalon Marshes peat bog



## **How long would it take for peat to grow as tall as you?**

Peat is formed very slowly! It 'grows' at a rate of around 1mm a year. *Ask your pupils to measure their height.* They could do this in pairs against a wall - put a sheet or two of paper on the wall, and they can mark their friend's height on it before measuring in cm what their friend's height is. They should convert their height in to millimetres, and this will give them the number of years it would take for peat to form to their height. So if a child is 1m 45cm tall, that is 1450mm, and it would take 1450 years for peat to form to that height!

*Ask them to imagine they are digging a big hole in a peat bog* (they've already scraped back the topsoil!). When the hole is as deep as they are tall, the soil they have reached is that age!

## **Artefacts**

We already know that wet areas with acidic conditions and where oxygen is lacking prevent proper decay of organic matter, leading to the formation of peat. For this exact same reason, objects from the past that were made from organic matter (wood, wool, bone etc), do not decay in peat bogs, and are instead preserved for hundreds or thousands of years. The Avalon Marshes has become internationally famous for discoveries like The Sweet Track and the Glastonbury Lake Village. Countless other discoveries have been made too - track-ways, settlements, hoards, offerings to gods and canoes. Not only has the peat preserved these items, it has also been the reason for their discoveries - many of them have been found whilst people dug up peat.

## **Why is peat important?**

Peat has played an important role in the Avalon Marshes: as a habitat; as a preserver of ancient objects; as a resource used for fuel and compost; and as a means of employment for many local people in the peat industry. Peat extraction has slowed but continues. Many areas where peat has been extracted are now conserved for wildlife.

*Ask you pupils what they think about peat being dug up from the wetlands. Should it still be dug up? Why?*

Some points to aid further discussion -

- Sites with suitable conditions for peat to form are very few and very small. And of course it forms very slowly. So peat can't naturally form as quickly as it is excavated.
- Raised peat bogs support rare plants and animals (such as sphagnum moss and sundew).
- Peat holds lots of water. Once it dries out, it cannot absorb water again.
- Peat bogs are one of Europe's rarest habitats - lots of these ancient habitats have already been destroyed.
- Peat stores huge amount of carbon. If it dries out in the ground, or is excavated and dried, that carbon is released in to the atmosphere.

- Peat compost is very popular with many gardeners. However, some gardeners seek alternatives to peat-based composts.
- Sphagnum moss grows on peat bogs. They hold an enormous amount of water, and are really handy in areas that are prone to flooding
- Peat bogs are beautiful and serene places to visit. The 'mire' on Westhay Moor is a great example of this.
- Some water has to be drained in areas where peat is going to be extracted.
- Within the Avalon Marshes community there are still strong bonds and a lot of pride linked to the area's history of peat extraction, and the thriving industry that existed for a long time.
- Because of peat's importance for wildlife and carbon storage, the government has set targets to phase out extraction by 2030.
- Some of the most important archaeological discoveries in the Avalon Marshes are still exactly where they were discovered – because the best place for them to be is left in the peat!

## **Discussion and debate**

Split your pupils into groups. Each will represent a different organisation or set of people, and must put together their argument in favour or against the extraction of peat. Give them information from this activity, and also give them time to do some independent research. Once they have done so, ask them to present their argument. You could ask them to actively debate the topic, or ask them to design a poster putting forward their arguments.

*Some examples of groups they could represent –*

Parker's Peat Company – a business selling compost products

The Plant Conservation Society – a local charity campaigning for the protection of rare plants

The Avalon Union of Peat Workers – a union representing the interests of people working in the peat industry

Avalon Archaeologists – local archaeologists and historians

The Countryside Walking Group – local people who like taking walks on nature reserves

Somerset Floodwatch – a group of local people campaigning to prevent flooding

## **Extension:**

- Look for a peat-free compost option and sow some seeds. Record how your seeds do. Do a controlled test and compare it with a peat-based compost.