

## Science

### Science

#### Key opportunities

As a woodland environment there is obviously a lot of scope for learning about nature, that is the natural materials that make up the geology of the place, as well as the wildlife that lives there.

There are distinctions that could be made between different natural materials, such as sand and gravel compared with chalk, as well as different wildlife habitats or homes (mixed woodland, coppice woodland, heathland), wildlife types or 'taxa' (trees, plants, birds, mammals, insects) and species (eg. badgers, rabbits, bats, squirrels - all as types of mammal).

There is also the possibility of all sorts of 'environmental science' investigations, perhaps focussing on topography (dips and slopes), soil depth and observation of weather conditions (for example the effects of altitude, direction of the prevailing wind etc).

#### Perry Wood Nature Trail

There are several maps available and a number of suggested trail routes. It is possible to devise your own trail personalizing the length and level of detail for Key Stages 1 & 2 (habitats comparison, using keys, counting number of species, ICT). Depending on the time of year, there are different types of wildlife that could be recorded – see the Year Wheel in Section 3. There are many links to work sheets and ways to record, as provided by this pack, the Woodland Trust and other organisations.

Combining subjects work well. Enquiry based learning with a scatter of different types of activity. For example, the use of poetry aids memory of important natural features and species (general habitat, not time of year specific). Cross curricular elements in any curriculum plan are very effective.

#### Species recording and understanding habitat

Plants, trees, insects, and small mammals can all be recorded on any walk through the woods. This pack provides a number of suggestions.

The area in and around Perry Wood is ideal for the researching of rural habitats. The concept of habitats is important. Children appreciate that a habitat is home for plants and animals. For young children starting by describing our own homes help provide the framework for identifying the homes of different plants and animals.

By recognizing that rural habitats, such as woodland or grassland, are the home for many different plants and animals brings out the important relationships between plants and animals. The key feature of this relationship is the ecosystem, the place where plants and animals live. With this in mind it is possible to introduce children to the idea of recognizing

the features of an ecosystem and making the point that ecosystems are dependent on a balance and an interaction between the features of that ecosystem. For example, the woodland is an area of no animal grazing so trees grow to create a woodland. The trees in the woodland create a canopy over the surface of the ground which means that certain types of plants grow as undergrowth. Beneath that undergrowth animals survive on the ground which is rich in leaf mould. This is a very rich environment for insects for most of the year. The understory includes shrubs and small trees that are the home of particular types of birds and insects.

The recording of different species, habitats and ecosystems can be usefully be set in the context of understanding the concept of habitats. Perry Wood provides an ideal opportunity to examine the woodland habitat.

### **Local natural materials project**

A walk from Perry Woods into other fields could focus on a comparative study of environments: the comparison of materials; the measurement of average stone size; the description of materials; the counting and recording of colours, different textures etc; the testing of the crumbliness of chalk versus hardness of flint, and pebbles; recognition of the different uses of natural occurring materials; the recognition of gravel extraction, chalk pits and other man-made features.

### **Biodiversity**

Perry Wood provides excellent opportunities for projects that focus on biodiversity begin with an understanding of the importance of habitats and an awareness of ecosystems. Biodiversity projects could include work by pupils on: the functioning of green plants; how life processes and physical processes work; the importance of caring for the environment; the nature and properties of natural materials, compare sand and gravel from Perry Wood with chalk and flint from other nearby sites helping to improve awareness of geology; the importance of protecting the environment from pollution such as the issues surrounding non-degrading materials which sometimes litter natural areas - like tin-cans, bottles, plastic bags etc; the investigation of food chains and micro-organisms; the comparison of different habitats and for all classes who work at Perry Wood, the vital importance of protecting the environment.

### **Remember**

There are opportunities for this type of scientific work with children in Perry Woods throughout the year. Seasonal changes provide great variety in the potential use of the woodland environment for children of all ages.

## Geology of Perry Wood

The present boundary of Perry Wood spans the summits of three distinct hills between Selling and Shottenden, west of Canterbury. The landscape and underlying geology of Perry Wood has influenced the pattern of settlement and industries in the wood. The underlying geology of Perry Wood is the Upper Chalk beds with a covering of layered ancient sea bed deposits laid down in the Eocene era. The chalk and its mantle of sea bed deposits were thrust upward by tectonic folding to form the 'Wealden dome' whose slopes now form the south and north downs. The ancient valley that now carries the river Stour formed the main drainage of the north facing slope of the North Downs and is deeply carved into the underlying chalk. Perry Wood is located close to the steep northern bank of this valley, which now forms a linear boundary along the southern edge of the upper reaches of the gently sloping Downs. In the extreme cold toward the end of the last (Devensian) Ice Age, melt water from the limit of the great ice sheet flowed down the frozen soil covering the North Downs slope, carving away the mantle of sea bed deposits and scouring into the underlying chalk. Networks of valleys were formed in characteristic tree like or 'dendritic' patterns. Along the steep edges of the Stour valley, between the upper branches of the valley networks remnants of the Eocene seabed deposits remained, preserved above the chalk. These remnants now stand as an irregular linear chain of rounded hills following the northern edge of the Stour valley with Perry Wood occupying the highest elevation, at the south western limit of this series of hills.

The geological deposits directly underlying Perry Wood is largely composed of the Thanet Beds sequence, with some small outcrops of the later gravelly Woolwich Beds sequence at the top of the hills. There are also patches of drift gravels ultimately derived from the Woolwich Beds deposit (BGS). Gravel and clay solifluction deposits, generated by successive periods of freezing and thawing at the limit of the ice sheet, settled into the valleys. The melt-water washed more ancient land surfaces into the valleys. Among the hard natural flints preserved in these deposits, heavy flint handaxes of the Palaeolithic era were also incorporated. Some of these tools have been found close to Perry Wood. In the Tundra conditions prevailing toward the end of the ice age, deposits of windblown loess, composed of sands and fine silts, were blown across the south of England, settling in the valleys over the earlier heavier solifluction deposits. The geological deposits shown in the local maps, as well as the distinctive landscape that were created in the area, represent a process of landscape change that formed the topography, and structured the settlement patterns that can be traced through archaeology. While many of these geological processes occurred at a time when human habitation was sparse, or even absent, they shaped the landscape that was occupied by the earliest hunter gatherers that colonised northern Europe after the last glaciations whose tools are some of the earliest artefacts encountered in Perry Wood, and are the first evidence for human settlement after the changes wrought by the Ice Age. Perry Wood now encompasses the summits and steep slopes of three hills forming a roughly triangular group, entwined with the upper reaches of periglacial valleys. The hill to the north east is irregular, with two distinct summits separated by a shallow saddle. To the south is a long undulating linear spur, indented by valleys on its east and western sides, the summit of this hill is located on the southern tip at an elevation of 150m.

The Mount, located on this summit is an observation point formed by an earth mound supporting a timber viewing platform. It has been suggested that The Mount itself might be a barrow mound, perhaps because Hasted (1798) described a very large barrow in the area, planted with Beech trees. However this feature was placed to the north of the Earthwork on Shottenden Hill and the Ordnance survey field inspection of 1963 suggested that the Mount had always been a purely ornamental feature. The western hill is separated from the southern hill by a deep valley, along which the main road and houses of the village of Perry Wood are located. The summit of this hill is relatively flat and L shaped in plan where a deep valley falls away toward the north west. In late 18th and early 19th century sources and maps (Cozens 1796, Hasted 1798 etc.) this hill is known as Shottenden Hill. Perry Wood was the name given to the eastern side of Shottenden Hill, now within the western side of Perry Wood. A windmill known as Shottenden Mill was located at the summit of the hill until the early 20<sup>th</sup> century and in later years this hill has been called Windmill Hill. In the later 18th century an Admiralty semaphore signal station was constructed at the summit of Shottenden Hill.

Thanet Archaeological Trust

## Geography

### Geography (and and some History).

Many of these projects are focussed on landscape change and management, so they also help to implement the curriculum for history. This can also remind the children that subjects can work together using the knowledge skills and understanding from different subjects to understand an issue or solve a problem.

### Key opportunities

Perry Wood offers a great deal of opportunity for studying the landscape and how it changes, hence combining study of geography and history. The landscape may seem like a natural place, but nowadays, what you can see is almost entirely shaped by people. It is not a wilderness.

The woodland itself has been hugely shaped by the activities of people. The history of the site, including the Earthwork, demonstrates this. Detail of the woodland, such as its 'ancient woodland' status, areas of coppice, general mixed woodland, natural regeneration and pine plantation show us how people have used and changed the woods over time. Many people were once reliant upon the woodlands for a source of fuel, fence posts, hop-poles, timbers for houses and ships, quarried sand and gravel, as 'wood pasture' grazing for animals, and also as somewhere to mill the wheat grown in nearby fields.

Of course now people tend to use the woodlands for quiet recreation. Perry Wood is a place that many people are drawn to for different recreational pursuits. Geographical enquiry could look at these different activities, the impact they might have on the physical and biological nature of the woods, and how they might be managed to offset any potential conflicts.

In addition the views from the wood give a great opportunity for study of, and comparison with the surrounding landscape. The views are panoramic and take in many different 'landscape areas' in East Kent. In nature, Perry Wood is more similar to Blean, but it is situated in the locality of the chalk downland of the Kent Downs Area of Outstanding Natural Beauty. There are many different places to spot and locate on a map; as well as landscape features to spot, such as orchards and hop-gardens, open farmland, other areas of woodland, villages and special buildings such as oast houses and Lees Court at Sheldwich. Not only is the landscape changed, but changing, and there is potential to talk about changes in farming and the food we eat, and how this in turn affects the landscape that we see.

### Suggested activities & lines of enquiry

1) A '**map as you walk**' activity could use the walk from the school to mark landmarks, such as veteran trees, paths, farm-buildings and houses, and any features that the children might spot that people may have made or changed in the woods.

Discussion and enquiry could then focus on how these features came about and why, for example an old hedgerow might have been kept and cut to provide shelter for people or animals, or to mark the boundary of this part of the woods; the path from the village to the woods might have been used to take wood back to log fires to keep people warm; or the Earthwork may have been made like a castle, to keep enemies out.

Pupils could use the blank map of Perry Wood to record their observations and understanding.

### **Classroom activity:**

A follow-up classroom activity could include discussion and enquiry into the way local people's lives have changed; and what the woodlands are used for now.

Part of the Discover Perry Wood work has enabled a group from the local community to obtain census data from the 1800s, helping us to understand the occupations and lives of the people that used to live here. For example the data has shown us that Richard and Isabelle Lambert lived at Mill Cottages in 1840 with their 5 year old son Fred. Were these the old cottages on Windmill Hill? What might Fred's life have been like? Where did he go to school? Looking at old photos might help to bring this history to life and encourage the children to think about how Perry Wood and the surrounding area has changed over the years.

There are still many houses in and on the edges of the woods. What do these people use the woods for now? How do they affect the woods in their everyday lives? How do the woods affect them?

This could lead to discussion of the rise in popularity of 'wood fuel' and how this is important for local sustainable development. We have a lot of coppice woodland in the Kent Downs, and our wildlife including birds, bats, butterflies and wildflowers, is dependent on us cutting glades and harvesting the woods like people used to in Victorian times and earlier when they used the wood for fuel and poles. Burning the wood in 'clean burn' stoves and boilers is better for the environment than burning gas and oil and it's good for our wildlife too. Does anyone burn wood at home? Could the school think about setting up a wood-chip boiler with help from grants from the Low Carbon Building Scheme? There's a thriving wood-fuel business being run by John Leigh Pemberton at the Torry Hill Estate about 5 miles away, which could be great destination for a school trip.

2) **Study the View.** An additional stage to this project, or a separate event could be looking at and interpreting the views. Key locations could be highlighted on a wider scale map for the children to spot, or they could simply pick a place to locate and try to find it on a map. A '**Draw the View/landscape sketch**' activity would then help children to really look at and study the landscape, starting to identify features such as:

### **Key Stage 1**

Fields, woods, hedges, orchards, houses, sheep etc . .

## Key Stage 2

Fruit, conifer plantation, mixed woodland, hedgerows, shaws, copses, oast houses, farmsteads, 'wildlife corridors' (links between woodlands, hedgerows and rough grasslands) etc . .

Either on-site or as a more detailed classroom activity, these drawings could be used in combination with photos taken on site, to start to list and talk around the features that were spotted.

This could lead to lines of enquiry like, where are most of the woodlands situated and why? (on the tops of the hills because they are hard to plough); which places that you can see, do you think it would be good for wildlife to live? (managed woods, hedgerows with some protection at the base, field edges, copses); what different crops can you see? Do you know what they are used for? How far do you think the crops will travel before they're used? (much wheat is used for fodder, food for cows and sheep, and many crops are exported on aeroplanes!). Do you know where most of the bigger roads are and why? (in the bottom of the valleys as they're the easiest route, often next to the river and railway). Can you imagine the wheat from the fields travelling to a grain store, and then off in a large truck to be ground? It used to be taken just to the top of Windmill Hill in Perry Wood! Do you know where the wheat for your bread comes from now?

For increasing understanding of sustainability, there could be discussion around using fuel to transport goods, and increasing global warming, so that's why many people like to buy food from local farmers at farmers markets; and why it's good to see more Kentish apples and strawberries in supermarkets. Did you know: There aren't many hop gardens anymore because the oil that's taken out of the hops is very concentrated and used in very small amounts, so it's cheap to bring in by plane from places very far away, like Canada and New Zealand. Can you find Canada and New Zealand on a globe? Isn't it fascinating to think how things so far away have helped to change the landscape around Perry Wood!

The drawings could also be used for art and design - developing patterns and prints from patterns in the landscape.

2) **Mapping the semaphore chain.** Key Stage 2 pupils could take the 'mapping' line of enquiry one stage further and look at the points on the semaphore chain that used Perry Wood as part of a link between London and the ports. Again, this would combine learning about geography and history. As an activity, this could be re-enacted at a small-scale by locating one group on the Pulpit Mount and one on Windmill Hill and helping them to send simple messages with coloured flags. They could reason using 'lines of sight' on a map, as to places where they should be able to see each other, and then do some 'ground-truthing' to check for tree-cover. This could be an invaluable tool to helping the children understand that these hill-tops have been kept open throughout history, for defence, to enable messages to be sent, and also so that the sails of the windmill could turn.

3) **A visitor study.** As part of learning about how people use the woods today, the children could use secondary data such as the interpretation and access plan maps, and habitat maps for Perry Wood. They could look at maps of footpaths and bridleways, and important areas for wildlife and learn about how to balance different uses of this important site. Looking at how people and wildlife live together in the woods, and if there are any problems.

They could list the types of activity that visitors use the woods for, (walking, wildlife-spotting, running, horse-riding, cycling, orienteering, drawing and painting, etc.) and even put together a questionnaire to ask visitors about what they value about a trip to the woods, and perhaps what they know about the importance of the Perry Wood for wildlife, wood-fuel and as a landmark in the landscape.

# History

## History Projects

### Key Opportunities

- The Earthwork, a history walk
- Victorian people
- Wartime in the Woods

As mentioned, many historical observations can be linked to the 'geography' projects, which look at landscape change.

At Perry Wood it is possible to study arrange of eras in history, and for empathising with and understanding past lives and cultures. The work carried out as part of the 'Discover Perry Wood' project has enabled a greater understanding of the importance of Perry Wood in the landscape throughout history, in particular in the prehistoric, Roman, civil war and Victorian eras. CDs, online collections of census data from the 1800s and old maps are available, providing a wonderful primary data source, whilst local people have spent some time analysing and writing up findings from this data, which has been summarised in information about the woods, giving a useful secondary data source.

There is also a lot that has not yet been investigated, such as details of wartime Perry Wood. Anecdotes relating to the taking down of the old Mill for firewood around the time of the First World War, and memories of a wartime bunker could be followed up; as well as the use of the place by the Salvation Army for concerts. Old place names on old maps help to tie together the threads of these investigations, for example, the main car-park was once known as 'The Bandstand'!

Importantly, it is known that Perry Wood has long been a favourite destination for people to come and picnic from Faversham, and other areas. Overall, it would be interesting to look at how perceptions of and use of the wood have changed throughout history, whilst there are plenty of small-scale more detailed projects that could be pursued.

The photographs included in this pack are an excellent starting point for analysis and discussion.

### The Earthwork – a history walk

There is one particular spot in the woods which has had a fairly remarkable history. The Earthwork, or 'Windmill Hill' that has been the site of finds of Mesolithic flints, earth workings probably from the Roman era, twelfth century pottery, civil war coins and roof tiles from the Victorian Era. Old maps, documents and photos can show us that there was a semaphore tower built in the 1790s. The maps can also show where the old windmill stood for many centuries, and where some cottages were sited. The Earthwork lies just adjacent to an old sand and gravel quarry - another potential place to investigate in the historical sources! Perhaps the simplest way to explain the mixed and rich history of this site in the

woods is to encourage the children to put together an illustrated timeline. They could also have access to the primary and secondary data sources such as photos of finds, copies of old maps, and summary information that are included in this pack. Once a time line is established pupils can link physical facts about the site and the finds to pictures of the sort of people who were involved at each stage in its past.

### **Victorian people**

Census data for the Selling area has been purchased for use by the local community as part of the Discover Perry Wood project. An example of this data is available in this pack and from the AONB office.