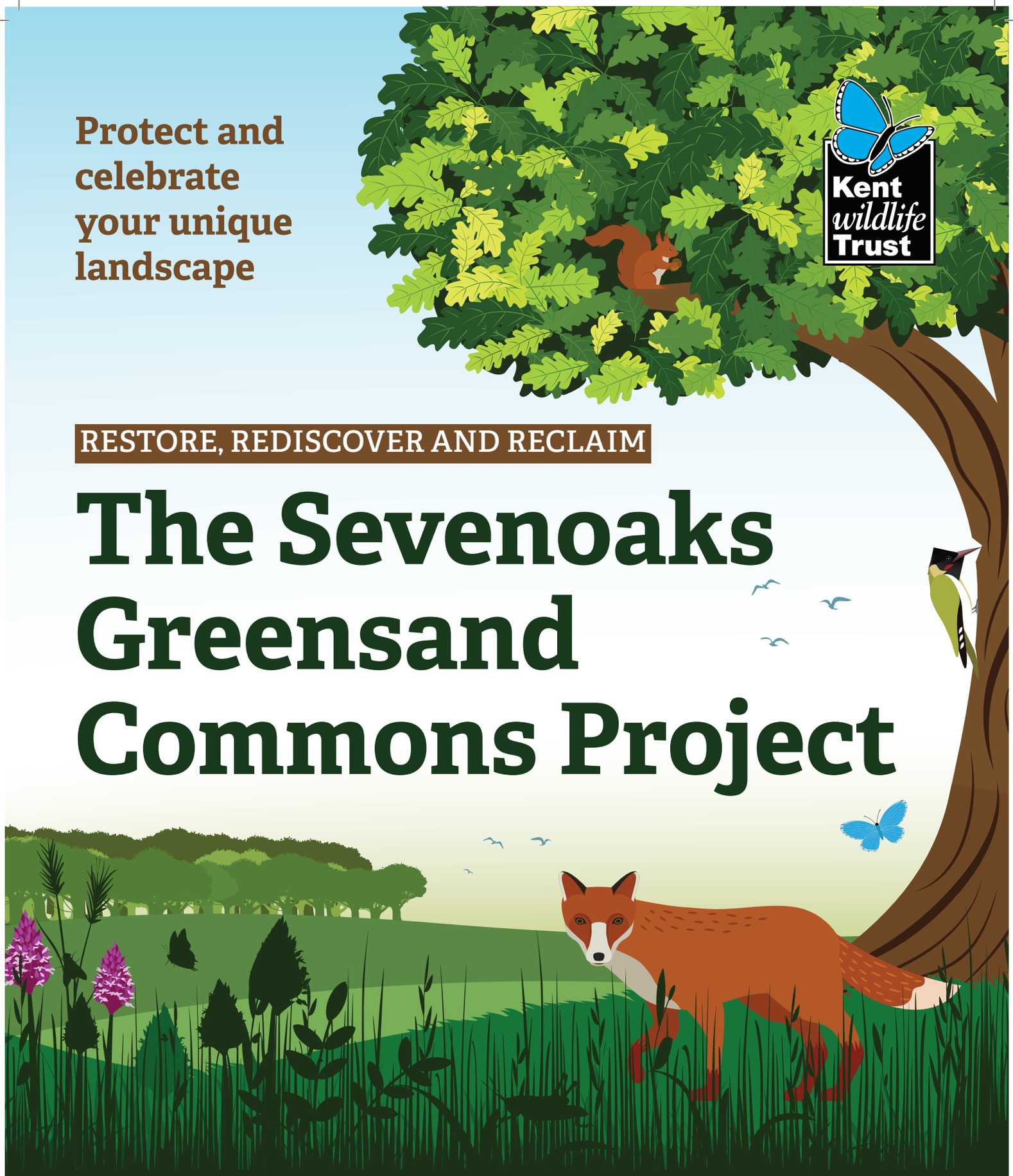
Protect and celebrate your unique landscape

Kent wildlife Trust

RESTORE, REDISCOVER AND RECLAIM

The Sevenoaks Greensand Commons Project



For more information visit
kentwildlifetrust.org.uk

Made possible with Heritage Fund

Sevenoaks DISTRICT COUNCIL

Contents

Introduction

This education pack has been designed to help teachers and educators use the landscape and heritage of Sevenoaks Greensand Commons as a resource for learning.

This pack contains activities and resources inspired by the Sevenoaks Greensand Commons Project, which covers a wide range of topics including geology, history and ecology.

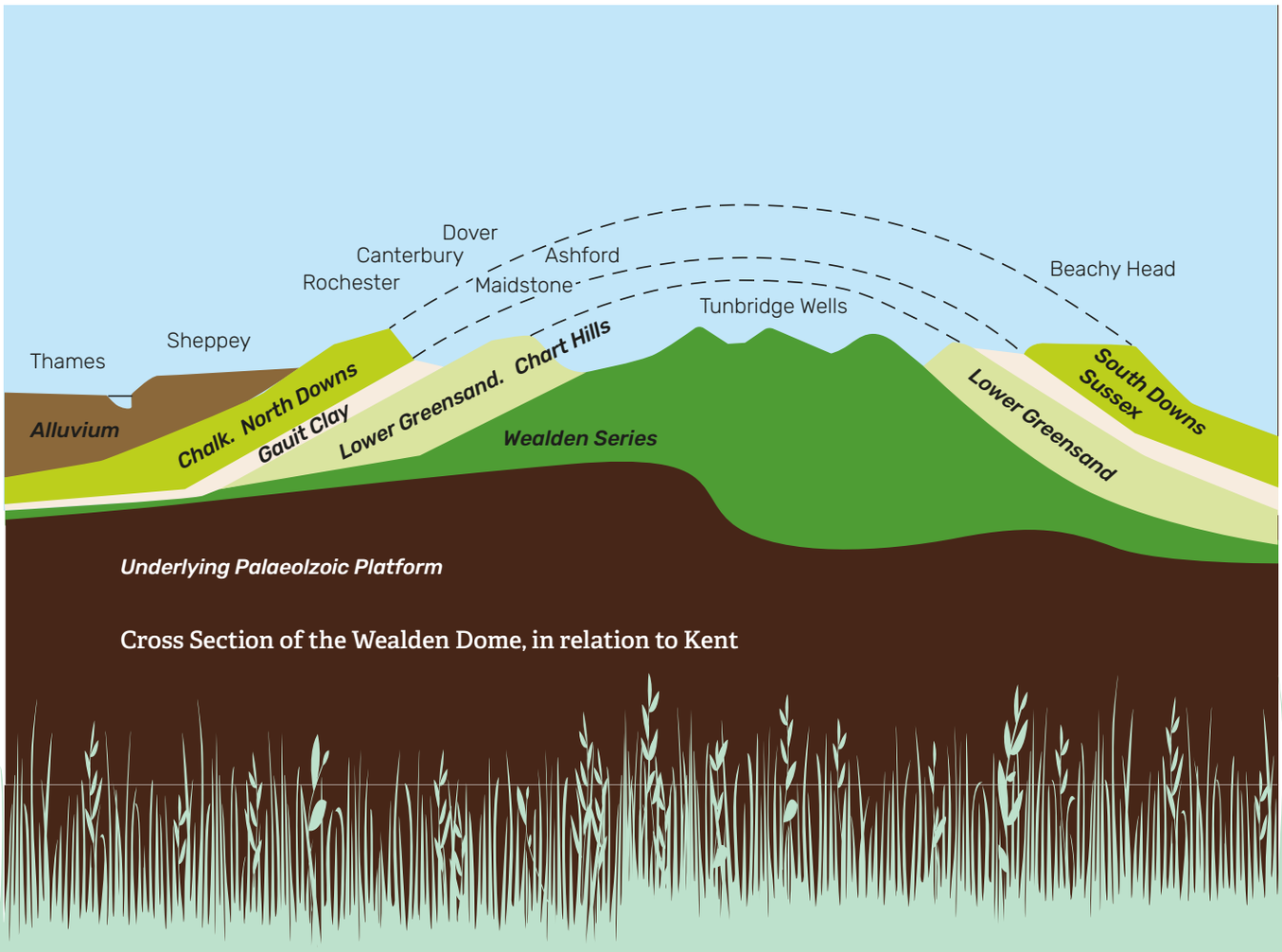
The aims of these activities are to help young people discover, explore and celebrate the natural and cultural heritage of the Sevenoaks Greensand Commons. The activities can be used as stand-alone tasks, incorporated into existing schemes of work or built into a Sevenoaks Greensand Commons programme of study with a focus on the local area and environment.

The project and this accompanying education pack seeks to explore and explain how the geology, history and ecology of the commons interlink and inform one another.

Watch us on **YouTube**

Find out more about the Sevenoaks Greensand Commons project here: https://www.youtube.com/watch?v=FA6JgCt-H54&t=105s

Geology of the Greensand Ridge



Cross Section of the Wealden Dome, in relation to Kent

The Sevenoaks Greensand Commons Project

The Greensand Commons of Sevenoaks and Westerham share a rich history and have been a vital resource for local communities for generations. The project aims to restore the commons as important open spaces with their fascinating history, abundance of wildlife and opportunities for public recreation and learning.

Location

- 8 project sites all on, or adjacent to, the Greensand Ridge, covering 300ha.
- Underlying geology means that most of the sites are quite acidic, which influences the ecology of the Commons. Historically they were easy to clear, but hard to farm. Many were managed as wood pasture, with heathland present.
- Steeped in natural and landscape history, these jewels are a unique resource for local communities.
- Evidence of use by Iron Age man, Romans, Saxons and Normans.

Rare habitats

- The Commons contain some unusual and rare habitats for Kent and, while much of the area is dominated by woodland, there are significant sections of acid grassland and heath habitat which is of high biodiversity value.
- As well as being in an Area of Outstanding Natural Beauty (AONB), the Commons are designated as Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR) for their areas of ancient woodland and open heathland. In addition, Hosey Common's tunnelled quarry workings are important sites for bat species such as Daubenton's, Natterer's, Whiskered, Brandt's and brown long-eared.

Find out more about the project by visiting the project website: https://www.kentwildlifetrust.org.uk/get-involved/our-projects/sevenoaks-greensand-commons

Teacher's Notes

Age Range:

The material in this pack is primarily aimed at learners in KS2 (8-11 year olds). However, the activities can be adapted for use with KS1 or KS3 students.

Summary of resources:

The cross-curricular activities are designed to be usable in the classroom or on school grounds with the intention to provide inspiration and a jumping off point for educators to extend learning to other sites, including the Sevenoaks Greensand Commons. By repeating the studies and investigations in different areas across the local area, learners may be able to make insightful comparisons. The activities can be used flexibly, easily adapted to suit varying needs, and modified for individual or group activities.

National Curriculum links:

Aspects of the KS2 National Curriculum programmes of study that the activities in this pack can link to:

KS1 & KS2 SCIENCE

Year 1 – Seasonal Changes

- observe changes across the 4 seasons.
- observe and describe weather associated with the seasons and how day length varies.

Year 3 – Rocks

- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- recognise that soils are made from rocks and organic matter.

Year 4 – Animals including humans

- construct and interpret a variety of food chains, identifying producers, predators and prey.

Year 5 – Living things and their habitats

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

KS2 GEOGRAPHY

- understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom, a region in a European country, and a region within North or South America.
- use fieldwork to observe, measure, record and present the human and physical features in the local area using a range of methods, including sketch maps, plans and graphs, and digital technologies.

KS2 HISTORY

- changes in Britain from the Stone Age to the Iron Age.
- the Roman Empire and its impact on Britain.
- Britain's settlement by Anglo-Saxons and Scots.

Fieldwork and Outdoor learning

Spending time in nature is known to improve health and well-being. Exploring outdoor learning environments can connect children with nature whilst linking to many aspects of the national curriculum. Some, but not all, of the activities in this pack include an element of outdoor learning and it is hoped that the pack will inspire educators to take the students out to explore the Sevenoaks Greensand Commons.

Risk Assessments

Staff will no doubt want to carry out their own risk assessments for activities. Each site will have specific considerations. As a starting point, a generic risk assessment for visiting a nature reserve or outdoor space is provided in the appendix. Make sure to consider how the time of year and time of day could affect your risk assessment.

Children can also be involved in risk assessments and learn from the opportunity to identify and evaluate potential risks rather than just being given boundaries and safety rules. This can be included at the start of any session:

- **Incorporate a risk assessment into the learning:** Ask students to consider risks they might come across on their field trip. What should be their golden rules for staying safe?
- **Setting boundaries:** When using an outdoor space for any of the activities, discuss with the children how far a safe distance for them to explore is. Get the children to suggest features to act as markers that they agree not to go beyond.
- **Respecting the environment:** Returning animals to their habitats after studying them. Not picking flowers. Litter picking.

Overview

This education pack has been split into three main themes: **Geology, History** and **Ecology**.

These three sections inform one another, just as they have on the Sevenoaks Greensand Commons. Pupils will begin by exploring the unique geology of the Greensand Commons. The stony ground and poor soil quality created by this unique geology led to a unique history in the area, where land clearance for timber dominated. This land use, and the continued historical human interaction with the land, led to the formation of a unique habitat – rare lowland heathland. Sevenoaks Greensand Commons is a special landscape where the geography has influenced the history and the history in turn has impacted upon the ecology.

Geography

The Greensand Ridge is an extensive sandstone escarpment in south-east England formed during the early Cretaceous period (125–110Ma). Lower greensand formed in very shallow seas as the land was sinking. Particles of sand washed from the land and were cemented together by lime in seawater. These formed bands of hard rock and, over millions of years, sea levels rose and fell, gradually revealing the Greensand ridge we have in Kent today. The ridge is characterised as having very stony, slightly acidic, impoverished soils. As a result, they were easy to clear of trees and vegetation, but very hard to farm. Historically, the geology of the ridge has influenced how the area has been used by man. This section of the workbook will explore the geology and geography of the Greensand commons.

Lesson 1 – The rocks and soils of the Commons **(KS2 Science)**

Lesson 2 – Human & Physical Features of the Commons **(KS2 Geography)**

Lesson 3 – Comparing geographical locations: Amazon rainforest and the Sevenoaks Greensand Commons **(KS2 Geography)**

Overview

History

The Greensand Ridge has been used by humans throughout the millennia for a variety of purposes, from stone age man right up to modern Britain. How man has interacted with the land has always been influenced by the unique geology of the area. Poor soil quality led to sites being used predominantly for timber, as opposed to be cleared to arable farming. The clearance of large areas through timber removal allowed rare lowland heathland to form. Varying land-use changes and human interactions with the site throughout history have created a mosaic of ancient woodland and heathland – a habitat which today is rarer than that of the Amazon rainforest. The geology of the site influenced the history, and in turn the history influenced the ecology. This section of the workbook will explore the history of the Greensand commons.

Lesson 1 – Land use changes in Britain from the Stone Age to the Iron Age: a Sevenoaks case study **(KS2 history)**

Lesson 2 – The Roman roads of Sevenoaks Greensand Commons **(KS2 history)**

Lesson 3 – Saxon settlements – village life on Sevenoaks Greensand Commons **(KS2 history)**

Ecology

The unique geology of the Greensand Commons has, throughout history, influenced the way humans have interacted with the landscape and as a result led to the creation of a rare habitat and unique landscape; a patchwork of ancient woodland, acid grassland and lowland heathland. This section of the workbook will focus on the unique ecology of the area, using a combination of science and maths to explore and discover its secrets.

Lesson 1 – Life cycles on Greensands commons: mammals, amphibians, insects and birds **(Year 5 - science)**

Lesson 2 – Producers, predators & prey of the commons - construct & interpret food chains **(Year 4 - science)**

Lesson 3 – Observe changes in the seasons on the Commons **(Year 1 - science)**

GEOGRAPHY

Lesson 1
The Rocks and Soils of the Commons

Aim:

To investigate the rocks and soils of the Sevenoaks Greensand Commons.

National Curriculum objectives:

- compare and group rocks on the basis of their appearance and simple physical properties **(KS2 Science)**.
- recognise that soils are made from rocks and organic matter **(KS2 Science)**.

Resources:

- A selection of different rocks and soil samples.
- Hula hoops or playground chalk (optional).
- Activity worksheets (see appendix).

Need rocks? Kent Wildlife Trust education department have a wide range of rock samples gathered from across the UK and the world which can be hired for a small fee. Contact education@kentwildlife.org.uk

Introduction

The rocks and soils that lie beneath the Sevenoaks Greensand Commons have for generations played an important role in the life of the commons. In this lesson, we will investigate a range of rock and soil types, learning about their properties and, in turn, will discover how the rocks and soils of the Sevenoaks Greensand Commons have influenced the history and ecology of the area.

What is a rock?

Ask the children if they know what a rock is. Leave this as an open question to see what the children think. This question can be asked again at the end of the lesson to see what the children have learnt.

Where can we find rocks?

Ask children where we can find rocks. Children may begin by making simple statements like in the garden, on the beach etc. The teacher can then lead the conversation to deeper thinking about rocks around us in our everyday lives, such as stone tiles in the bathroom, granite worktops, diamonds in jewellery etc.

Do we know any names of types of rock?

Ask children if they can name any rocks. Children may be able to name some rocks, such as chalk or flint; if so, ask children to describe those rocks. Start to create a word bank on the board of common words used when describing the rocks: e.g. hard/soft, shiny/dull, rough/smooth.

Where do rocks come from?

Ask children where rocks come from; most will likely say from the ground. Explain that there are 3 main types of rock, formed by different processes (this is not explicitly part of the KS1/KS2 curriculum, but worth noting briefly at this stage).

- **Sedimentary rocks** - are formed over millions of years when layers of sediments (tiny pieces of rocks and animal skeletons) are pressed together at the bottom of seas and rivers.
- **Igneous rocks** - formed when magma or lava from volcanoes cools.
- **Metamorphic rocks** - are formed when other rocks are changed due to extreme heat or pressure.

The rocks we find at Sevenoaks Greensand Commons are a type of sedimentary rock called sandstone; specifically greensand due to its greenish colour (a result of a mineral called glauconite). Lower greensand formed in very shallow seas as the land was sinking. Particles of sand washed from the land and were cemented together by lime in seawater.

Sea level changes gradually revealed the Greensand ridge we have in Kent today.

"The study of rocks is called geology and those who study rocks are called geologists."

GEOGRAPHY

Lesson 1
The Rocks and Soils of the Commons

ACTIVITY 1

Describing Rocks

Give each pair/group of "geologists" a rock each. How many different ways can they describe that rock? Provide the group with a word bank (see appendix) to support the description. Place the rock in the middle of a sheet of paper and ask the group to write as many descriptive words and/or phrases to describe that rock as they can. Encourage the children to pick up and feel the rocks and, if possible, provide them with hand lenses to encourage closer inspection of the rocks.

Extension: Keep the rocks and sheets of paper on the tables and ask groups to rotate around the room and look at another rock.

Ask the children to read the descriptions written by the last group. Do they agree? Is there anything they could add?

ACTIVITY 2

Sorting Rocks

There are many ways you could do this activity to make it engaging for the children, including the use of hula-hoops on the floor, large circles drawn on the playground with chalk, or using the resource sheet (see appendix).

Create two large circles and ask children to use some of the vocabulary from earlier in the lesson to label each of the circles using a strip of paper. Let children choose the labels; they could choose to sort by "big" / "small" or by "shiny" /"dull". How many different ways can children sort the rocks? Begin to encourage more creative thinking, such as comparing based on grain size or whether the rock has layers or crystals. Challenge the children's learning by overlapping the circles to create Venn diagrams. Challenge further by adding a third circle and a third sorting category.

Swap rocks between groups to add variety to the task and maintain interest.

Extension: Challenge children to have a go at sorting the rocks by rock type (igneous, sedimentary and metamorphic). A helpful guide to identifying rock types can be downloaded from the Natural History Museum here.

ACTIVITY 3

Investigating Soil

Ask children what soil is. Explain that soil is a thin layer of material that covers the earth's surface and is produced by the gradual weathering of rocks over time, as well as the build up dead organic matter, such as leaves and twigs. Watch the short video clip from the BBC to help explain soils.

Gather some soil and share it out between the groups. Using a tray and some tweezers and/or spatulas, ask the children to sort the soil into the three categories: living things; things that used to be living; and things that have never been alive (use the resource sheet in the appendix to support). Explain that most "living things" within soil will be microscopic but groups may well find other insects and worms in their soil samples.

Ask children if they think all soils are the same. Explain that the type of soil you have can depend on the type of rocks in the area. If there is a lot of chalk, the soil will be crumbly and stony, whereas clay rich soil is quite sticky.

GEOGRAPHY

Lesson 1
The Rocks and Soils of the Commons

PLENARY

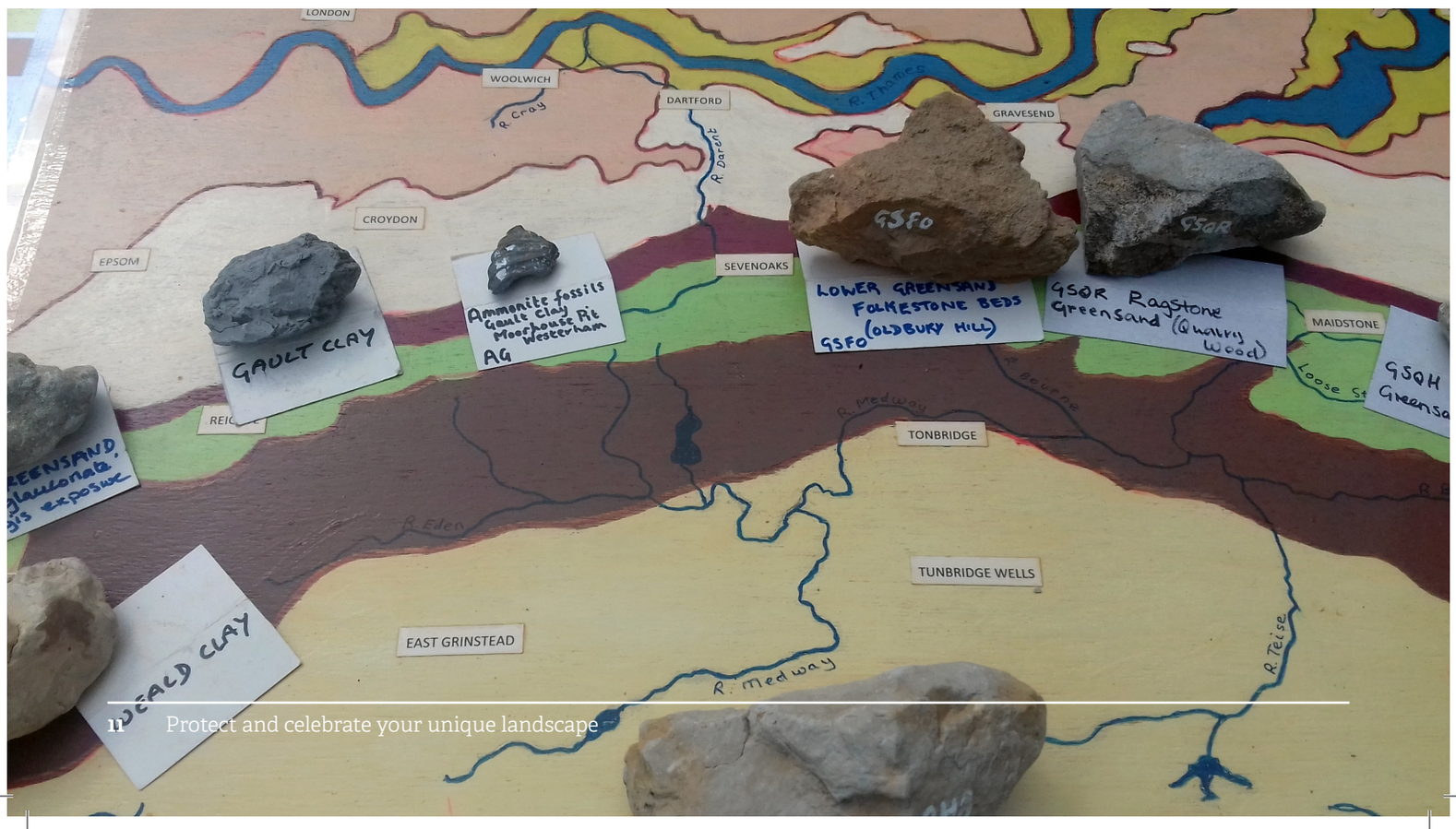
The rocks and soils of the Sevenoaks Greensand Commons

The soil of Sevenoaks Greensand Commons is influenced by the underlying sandstone, making it stony, slightly acidic and not very fertile. Poor soil quality has led to the area being used for timber as opposed to arable farming over the generations. Timber removal led to the clearance of large areas, which allowed rare lowland heathland to form. As you move through this learning pack, you will discover more about how the unique geology and poor soils of the Sevenoaks Greensand Commons has influenced the human and ecological history of the area.

Why not take your learning outside!

This lesson can easily be adapted to be delivered outside, either within your school grounds or on a school visit to the commons; here, you will be able to investigate first-hand the rocks and soils of the commons. All of the Sevenoaks Greensand Commons nature reserves are free to enter and have public access to parts of the sites.

If you would like to arrange an organised visit to the site with one of our trained education tutors, then contact Kent Wildlife Trust's education team on **education@kentwildlife.org.uk**



GEOGRAPHY

Lesson 1 - Resource Sheet 1

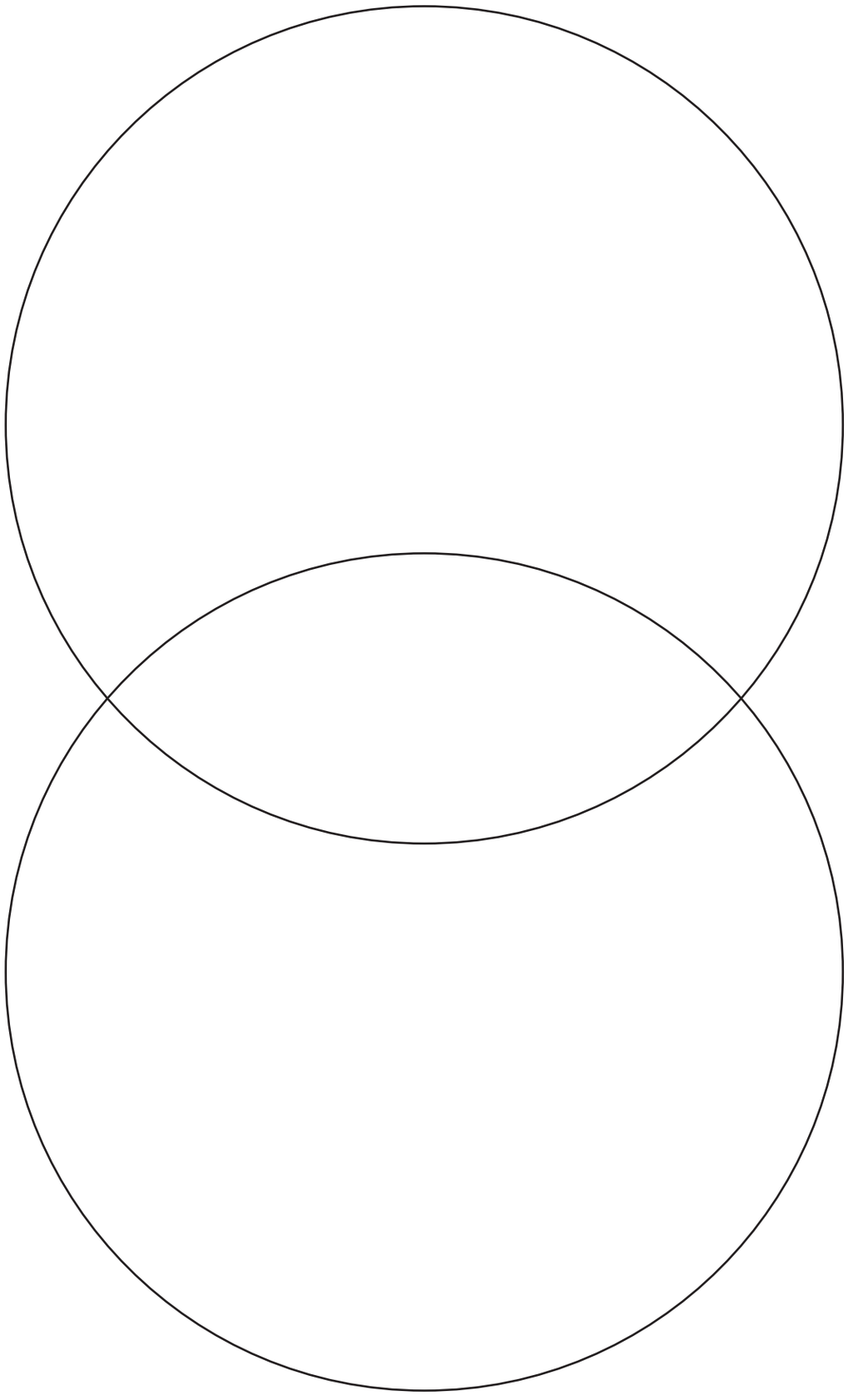
Describing Rocks Word Bank

Hard	Jagged
Soft	Round
Rough	Crumbly
Smooth	Grainy
Heavy	Flaky
Light	Permeable (has lots of small holes)
Shiny	Granular
Dull	Layered

GEOGRAPHY

Lesson 1 - Resource Sheet 2

Sorting Rocks



GEOGRAPHY

Lesson 1 - Resource Sheet 3

Investigating Soil

Living things (biotic)	Things that used to be living (biotic)	Things which have never been alive (abiotic)

GEOGRAPHY

Lesson 2
Human & Physical Features of the Commons

Aim:

To investigate the human and physical features of the Sevenoaks Greensand Commons.

National Curriculum objectives:

- Use fieldwork to observe, measure, record and present the human and physical features in the local area using a range of methods, including sketch maps **(KS2 Geography)**.

Resources:

- Pencils, rulers and clipboards.
- Digital cameras.
- Activity resource sheets (see appendix).

Introduction

Begin the lesson by asking children if they know what geography is and what geographers study. Explain that geography is the study of the Earth's human and physical features and how they interact with each other.

Encourage children to "think like a geographer" by asking them to pose questions about their locality. Key questions could include:

- What is the name of this place?
- What is this place used for?
- What other places are nearby?
- How does this location link with other nearby locations?
- Has this place changed? How and why?
- Is it similar to other places I have been? How and why?

Take a walk outside, either within your school grounds, your local area or make use of the commons. As you walk, continue to encourage children to pose questions about the locality.

GEOGRAPHY

Lesson 2
Human & Physical Features of the Commons

ACTIVITY 1

Identifying Human and Physical Features of the Landscape

Continue your walk outside. Introduce the terms "human features" and "physical features". Ask children if they can explain what you mean by this. Explain that human features relate only to the human environment; something that is built by humans and would not have existed in nature without humans. Physical features relate to natural things in the landscape like rivers, forests, hills and mountains; things that would still be here even if there were no people around. As you walk, ask the children to begin identifying the human and physical features around them.

If available, use cameras to take photos of the environment. Encourage children to photograph a range of different landscapes, which capture both human and physical features of the landscape. When back in the classroom, print these photos out and ask children to annotate the human and physical features onto their photos (see Appendix for examples.)

If you are unable to go outside, an alternative could be to use Google Earth and utilise the street view application which will take you right down to street level within a locality.

Extension: Challenge children's thinking by posing features such as man-made canals, timber plantations or manicured lawns. Are these features human or physical features? A canal looks like and behaves like a river, but would it be there if not for human intervention? If a well-cared for lawn, such as a school field, was left free of human intervention, would it still look the same? What would change?

ACTIVITY 2

Identifying Human & Physical Features on a map

Using the links below, provide children with maps of the Greensands Commons. Alternatively, you could use Google Earth to produce maps or aerial photos of your own locality. Ask children to look at the maps and, working in pairs, begin to identify the human and physical features within the landscapes. Children could annotate directly onto the maps, use a colour key to identify features, or stick the maps into books and annotate around the map.

- Bitchet Common Map
- Crockham Hill Common Map
- Farley Common Map
- Fawke Common and Godden Green Map
- Hosey Common Map
- Seal Chart Common Map
- Sevenoaks Common Map
- Sevenoaks Weald Common Map

Introduce the children to the idea of habitat fragmentation - when parts of a habitat are destroyed by human interaction, leaving behind smaller unconnected "islands"; this causes species to become isolated on these islands, making it hard for them to find food or mates. Ask children if they can identify any causes of habitat fragmentation on their maps. Commons causes include roads, housing estates and farmland.

GEOGRAPHY

Lesson 2
Human & Physical Features of the Commons

ACTIVITY 3

Sketch Maps

Introduce the concept of sketch maps as a simplified version of a map that can be drawn by hand when in the field. Sketch maps can be drawn from a birds eye view or can be a drawing of the horizon. Sketch maps can be annotated and often have a key.

Provide each child with a clipboard, a piece of paper and a pencil and take them outside, either onto the Commons or in your own locality. Ask children to create a sketch map of what they see around them. Ensure that children are including both the human (roads, buildings etc) and the physical (rivers, streams, woods etc) features on their maps. Children may want to make a key to identify the human and physical features of the landscape.

PLENARY

Human and Physical Interaction

Human activities can modify the natural environment, and in turn, the physical characteristics of a place can influence human behaviour and settlement patterns. This is evident on Sevenoaks Greensand Commons.

As discussed in **Geography: Lesson 1,** the poor soil quality of the Commons has led to the area being used predominantly for grazing and timber over the years, and not for arable farming. Timber removal led to the clearance of large areas, which allowed rare lowland heathland to form; a rare habitat which is now managed by Kent Wildlife Trust in order to preserve it. Grazing by sheep and cattle is used to control the growth of scrub and trees, and the Trust also carries out heathland restoration works such as the removal of invasive species like rhododendron. The commons have become an important recreational space for nearby residents; the site is used for activities such as hiking, bird watching, and nature education.

Discuss with the children the relevance of human and physical interactions in your locality. How has the coastline, a river or local woodland affected how humans interact with the physical landscape? What changes have humans made to the landscape over the last 1, 10 or 100 years?

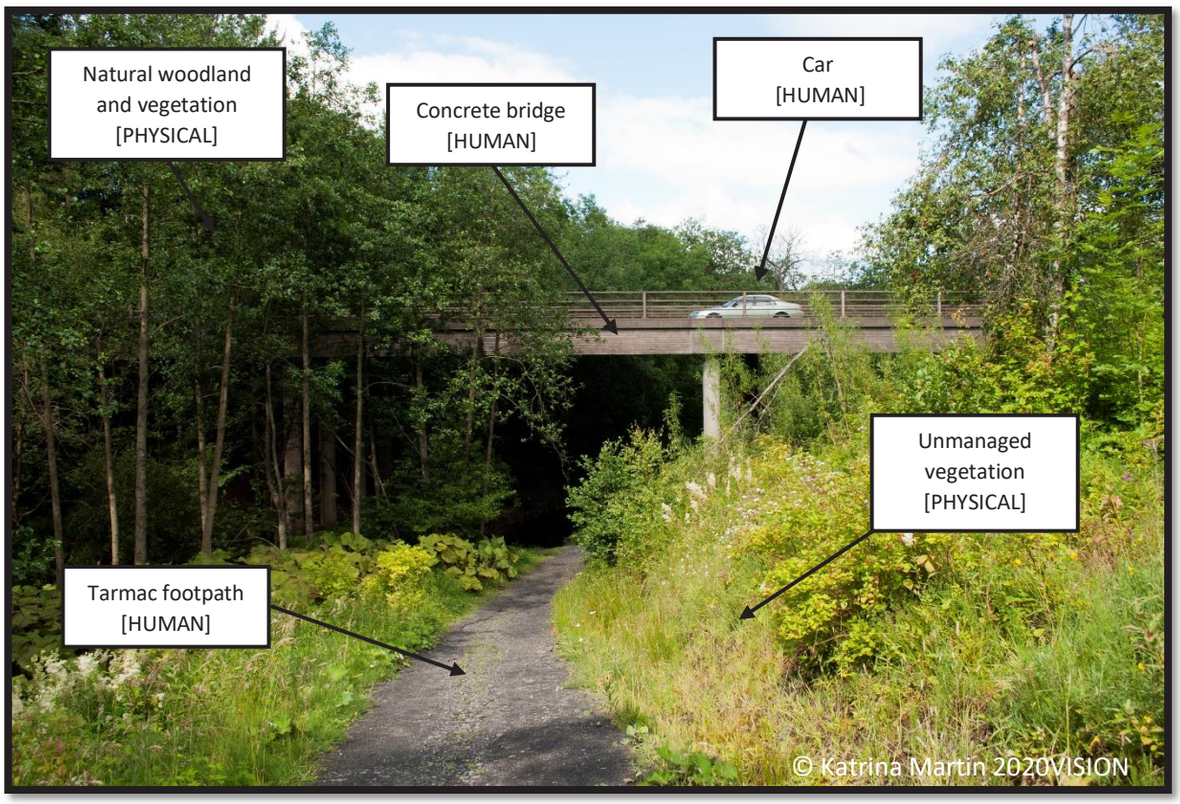
Why not take your learning outside!

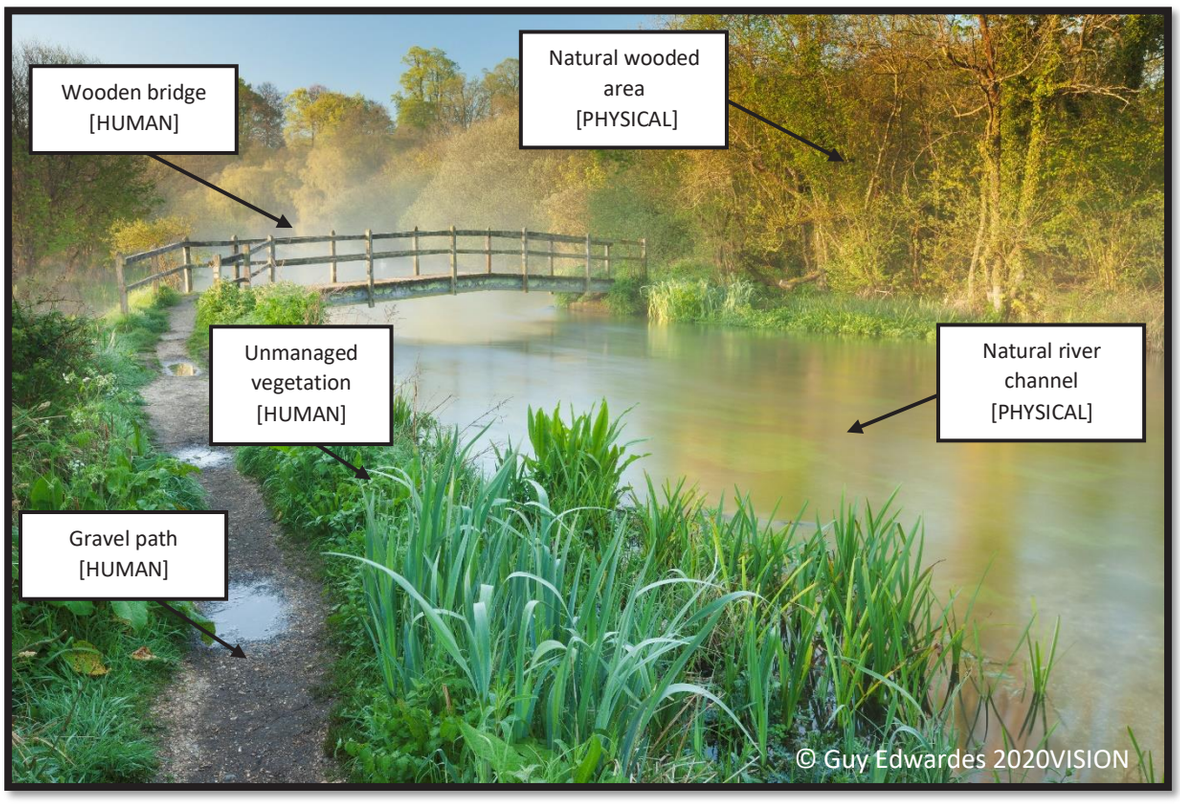
This lesson has been designed to be delivered with a focus on either the Sevenoaks Greensand Commons or with a focus on your school's locality and can be delivered both outdoors and in the classroom. All of the Sevenoaks Greensand Commons nature reserves are free to enter and have public access to parts of the sites. If you would like to arrange an organised visit to the site with one of our trained education tutors, then contact Kent Wildlife Trust's education team on **education@kentwildlife.org.uk**.

GEOGRAPHY

Lesson 2 - Resource Sheet 1

Human & Physical Features

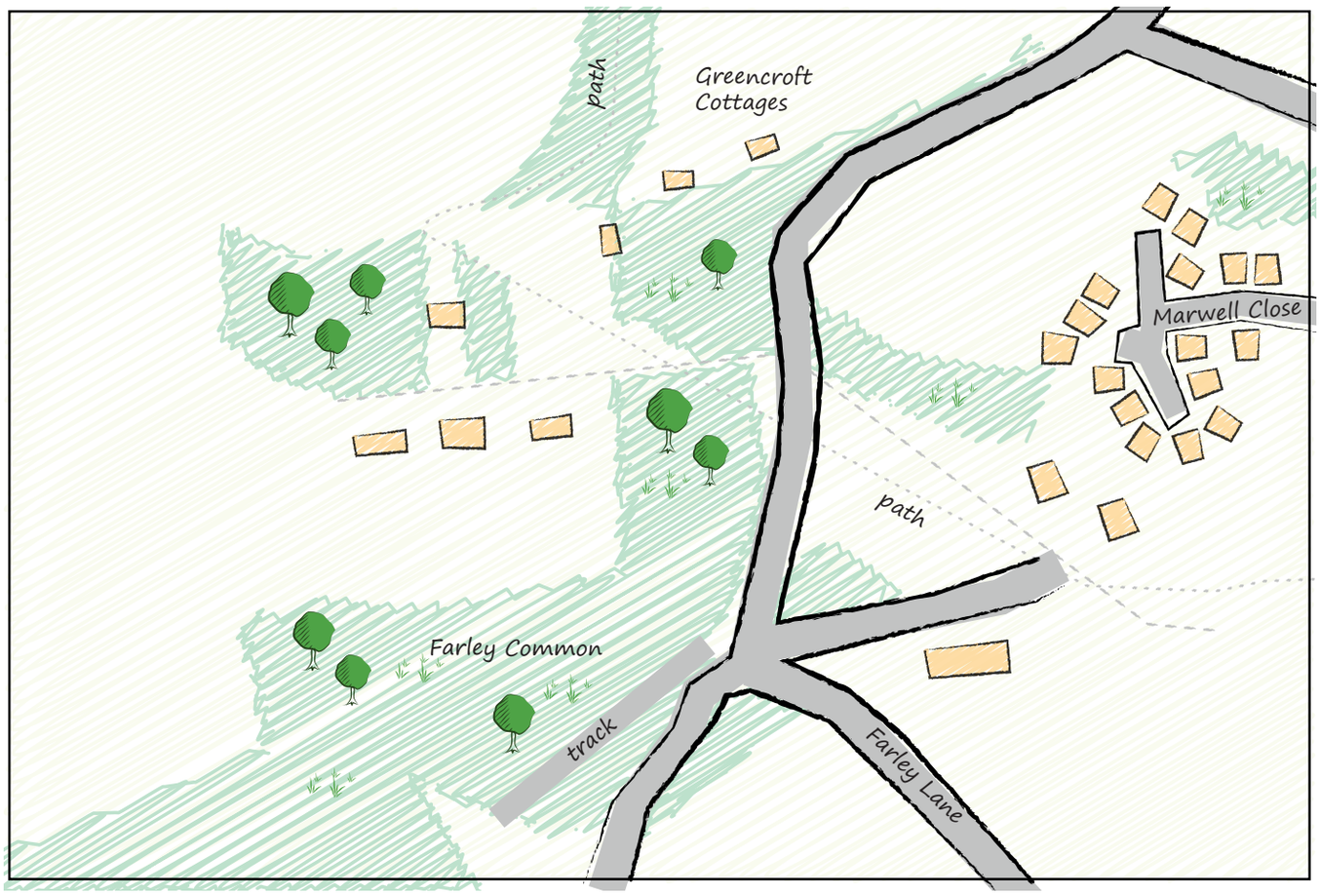




GEOGRAPHY

Lesson 2 - Resource Sheet 2

Sketch Map Example



GEOGRAPHY

Lesson 3

Comparing geographical locations: Amazon rainforest & the Sevenoaks Greensand Commons

Aim:

To investigate the human and physical features of the Sevenoaks Greensand Commons.

National Curriculum objectives:

- Understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom and a region within South America **(KS2 Geography)**.

Resources:

- Access to internet.
- Something for taking notes (post-it notes, whiteboards, notebooks).
- Poster paper and art supplies.

Introduction

Begin the lesson by asking if the children have heard of the Amazon rainforest. Lead a discussion with the children on the significance of the Amazon rainforest and the importance of protecting it.

Ask children if they have heard of the Sevenoaks Greensand Commons. Explain that the commons are home to heathland – a habitat rarer than Amazonian rainforest which is also under threat and needs protection.

Heathland has declined greatly in extent during the last two centuries – in England it is estimated that only one sixth of the heathland present in 1800 remains – and it still faces major pressures.

GREENSAND COMMONS HEATHER

AMAZON RAINFOREST

GEOGRAPHY

Lesson 3

Comparing geographical locations: Amazon rainforest & the Sevenoaks Greensand Commons

ACTIVITY 1

Exploring the landscape

Use Google Earth (making particular use of the Street View feature) to explore the Amazon rainforest. Give children plenty of time to explore, asking them to make notes on the human and physical features of the habitat using post-it notes/whiteboards/notebooks. Repeat for Sevenoaks Common (or another location of your choice). If children are unfamiliar with human and physical features, please refer to **Geography Lesson 2: Human & Physical Features of the Commons**.

Pupils can be supported in this activity by providing them with photos and images of notable physical features. For the Amazon, this could include the Amazon River, the rainforest, and the Andes mountains. For Sevenoaks Greensand Commons, this could include the chalk cliffs, the sandstone outcrops, and the heathland.

After giving groups time to explore the two habitats, begin to gather notes on each habitat on the board. This could be done by splitting the board in half, one side with differences and one with similarities, or creating a Venn diagram to identify features which are present in one or both habitats. As a class, discuss some of the most significant differences between the two locations.

ACTIVITY 2

Researching human and physical features

Children will now research one element of either the human or physical geography of each location in greater detail. Divide the children into groups of 6-8 pupils. Assign one of the human or physical features from the list below to each group and then split the group in half, with one half researching the Amazon rainforest and one the other half researching Sevenoaks Greensand Commons (heathland habitat).

Physical Features:

- Climate: temperature, rainfall, humidity
- Landforms: mountains, hills, valleys, rivers, lakes
- Natural resources: minerals, timber, water, soil
- Vegetation: types of trees, plants, flowers, crops
- Animals: species of mammals, birds, insects, reptiles, amphibians

Human Features:

- Settlements: cities, towns, villages, farms
- Transportation: roads, railways, airports, ports
- Infrastructure: bridges, dams, power plants
- Culture: customs, language, music, festivals
- Economic activities: farming, logging, mining, tourism, trade, industry

Allow the groups time to research their location, using the prompts provided in the appendix to support. Once the research is complete, ask the two halves of the group to come back together and discuss the similarities and differences for their assigned human/physical features.

To finish, give each group poster paper and art supplies to create a visual presentation of their findings. Encourage the students to include photographs, diagrams, and maps where possible to illustrate their points.

GEOGRAPHY

Lesson 3

Comparing geographical locations: Amazon rainforest & the Sevenoaks Greensand Commons

PLENARY

After the posters are complete, give each group the opportunity to present their findings to the class. Allow the rest of the class to ask questions and discuss the similarities and differences between the two locations. The teacher can facilitate the discussions and add more notes to the whiteboard table or Venn diagram from the start of the lesson.

Wrap up the lesson by asking the students to reflect on what they have learned. Ask the students to share one or two interesting facts that they learned from their research and group presentations. Encourage them to use specific examples from both locations. Facilitate a class discussion where students compare and contrast the human and physical features of the two locations. Encourage them to use comparative language such as "similarly," "in contrast," and "on the other hand." Ask the students to reflect on the importance of studying human and physical features in geography. What did they learn about the different types of features found in contrasting environments? Finally, end the plenary by summarizing the main similarities and differences between the Amazon Rainforest and Sevenoaks Greensand Commons, and highlighting the key takeaways from the lesson.

Below is a list of internet links which students may find useful in this lesson. Encourage children to use research from a range of sources, including books and videos, as well as websites. When using search engines, it is important to talk to children about responsible and safe use of the internet and about using trusted sources. Using child friendly search engines like Kiddle and Swiggle will help with this.

Amazon rainforest links:

- Google Earth: Amazon
- WWF – Inside the Amazon
- WWF – The Amazon
- National Geographic Kids: Rainforest
- DK Find Out! – Amazon Rainforest
- Mongabay: The Amazon Rainforest

Heathland links:

- Google Earth: Sevenoaks Common
- Sevenoaks Greensand Commons
- Wildlife Watch - Heathland
- Wildlife Trust – Heathland and Moorland
- RSPB – Heathland Habitats
- Woodland Trust – Heathland and moorland

GEOGRAPHY

Lesson 3 - Resource Sheet 1

Research prompt questions

Physical Features:

What is the climate like in this location? Is it hot or cold? Wet or dry?

What are some of the landforms found in this location? Are there any mountains, rivers, or valleys?

What types of vegetation are found in this location? Are there any endemic plant species?

What types of animals can be found in this location? Are there any endangered species?

What are some of the natural resources found in this location?

Human Features:

What types of settlements can be found in this location? Are there any cities, towns, or villages?

What types of transportation are used in this location? Are there any major highways, railways, or airports?

What types of infrastructure are found in this location? Are there any bridges, dams, or communication towers?

What is the culture like in this location? Are there any unique customs or traditions?

What are the major economic activities in this location? Are there any major industries, such as farming or mining?

Comparing Features:

How does the climate in this location compare to the other location?

What are some similarities and differences in the landforms found in these two locations?

How does the vegetation in one location compare to the other location?

Are there any similarities or differences in the animals found in both locations?

How do the human features, such as settlements and infrastructure, compare in both locations?

HISTORY

Lesson 1

Changes in Britain from the Stone Age to the Iron Age: a Sevenoaks Greensand Commons case study

Aim:

To investigate Stone Age to Iron Age human activity in and around Sevenoaks Greensand Commons.

National Curriculum objectives:

- Pupils should be taught about changes in Britain from the Stone Age to the Iron Age.

Resources:

- Access to research material (internet, books, library).
- Paper, card, pens and other art and craft supplies.

Introduction

There is evidence of human activity in the Sevenoaks Greensand Commons from as early as the Neolithic period right through to the Iron Age.

During these periods, significant changes took place in human history, including the development of agriculture, the creation of tools and weapons, and the construction of monumental structures. In this lesson, pupils will be exploring how these historical periods unfolded in the Sevenoaks Greensand Commons area, examining the archaeological evidence left behind by these early societies and how they shaped the landscape that we know today.

This lesson has been designed to be flexible and can be delivered to suit the learning needs of your class. You could work through each activity in turn, progressing through prehistory up to the iron age, or you could choose to focus your attention on one period of history, taking a more in-depth look at that period.

ILLUSTRATION OF PRIMITIVE DWELLINGS

HISTORY

Lesson 1

Changes in Britain from the Stone Age to the Iron Age: a Sevenoaks Greensand Commons case study

NEOLITHIC PERIOD – 10,000 BC - 2,500 BC

Hunter gatherers to farmers

The start of the Neolithic period was major turning point for the development of human societies. Neolithic ("new-stone") refers to a period of time during which humans began to use polished stone tools and to engage in agriculture and animal husbandry. New ideas and technologies laid the foundations for the development of the landscape into what we can see today. The biggest change during this period was a shift from hunting & gathering to farming. This change is likely to have been a gradual one and, throughout the Neolithic period, a mixture of hunting, gathering and farming would have sustained the communities living in the Sevenoaks Greensand Commons area: there is evidence of both.

Stone tools:

Flint shards have been found in various locations across the Sevenoaks Greensand Commons, most notably at Ightham, close to Seal Chart, providing evidence of flint tool production in the area. Show children the clip from BBC Teach, demonstrating how some of these flint tools were made. Discuss with children some of the animals that Neolithic man would have hunted using these tools, including red deer, boar, wild horses, aurochs and bison. It is worth noting that whilst many of these species became extinct in the UK, Kent Wildlife Trust, through their Wilder Blean project, are working to restore the natural biodiversity of the landscape by bringing back keystone species such as the bison.

SUGGESTED ACTIVITY

Children could research stone age tools, including hand axes, spears and bow & arrows. Having researched stone age tools, children could then design their own tool, labelling the materials used (flint, bone, wood, beeswax etc) and provide an explanation for how the tool would be constructed and how it would be used.

SUGGESTED ACTIVITY

Children could research the diet of hunter gatherer societies in the UK during this period. The class could be split in half, into hunters and gatherers, and using the internet and books children could research what foods would have sustained hunter gatherer societies during this period. This activity could be extended to look at how food types would change seasonally. Children could create presentations and/or posters to present to the class.

Land clearance

The change from hunter gatherers to farmers required the clearance of woodland for pasture and crop fields. The first domesticated animals were sheep, pigs and goats and the first crops barley and wheat. Evidence of forest clearance has been found in the area of Greenhill, just outside of Otford north of Sevenoaks. Share the BBC Teach clip on Stone Age farming.

SUGGESTED ACTIVITY

Having spent time learning about and researching farming practices of Neolithic man, children could create a diorama of a Neolithic farm, using a carboard box (shoe box) as a base. Children should create different parts of the farm, including fields for crops, areas for livestock, and any other features they find relevant. Encourage children to add small details to their dioramas, such as rocks or pebbles for a more realistic look. If available, children could also add small toy farm animals or plastic trees and bushes to their diorama. Once completed, have the children present their dioramas to the class and explain the different aspects of their Neolithic farm and the farming practices used.

HISTORY

Lesson 1

Changes in Britain from the Stone Age to the Iron Age: a Sevenoaks Greensand Commons case study

BRONZE AGE – 2,500 BC to 800 BC

Burial Mounds (Seal Chart)

Occupation of the Sevenoaks Greensand Commons area by humans continued from the Neolithic period into the Bronze Age; settlements expanded and land clearance continued to shape the landscape we see today.

Evidence of Bronze Age occupation comes in the form of bronze age burial mounds or barrows. Examples of barrows have been found in the landscape surrounding Greensand Commons, including Otford Mount and Watery Lane, near Seal Chart. Share with children the BBC Teach clip on Stonehenge and burial barrows. One of the best examples of a bronze age ceremonial burial is that of the Amesbury Archer who was found buried with around 100 objects – all of which give us clues as to his life.

SUGGESTED ACTIVITY

Ask pupils to design a Bronze Age barrow with a 'mystery character' buried inside. Children must choose which Bronze Age objects will be buried alongside their character and then write a paragraph to explain what the objects tell them about the person and the society they lived in. This could spark a conversation with children on what objects they would like to be buried with if they were trying to teach a future archaeologist what sort of person they are.

EXAMPLE OF A BURIAL MOUND

HISTORY

Lesson 1

Changes in Britain from the Stone Age to the Iron Age: a Sevenoaks Greensand Commons case study

IRON AGE – 800 BC to 43 AD

Hill Forts

During the Iron Age there were several developments that were to have a significant impact on the landscape; the use of iron allowed for better farming tools and improvements in agriculture. As a result, populations grew and there is evidence in the Sevenoaks area of expanding farmland. The best evidence we have of Iron Age occupation in the area comes in the form of Iron Age hillforts. Examples of these can be found at Oldbury Hill, close to Seal Chart Common, and Squerryes, just north of Crockhamhill Common.

Hillforts were typically constructed on high ground, such as hilltops, and were designed to be easily defendable. They usually had one or more walls made of earth, stone, or timber, and sometimes had ditches dug around them as an additional defence. Inside the hillfort, people would live in houses made of wood, thatch, and wattle-and-daub, and would farm the surrounding land. Hillforts were important places for communities to gather, trade, and socialize, as well as offering protection from potential enemies.

SUGGESTED ACTIVITY

Share the video from BBC Teach on Iron Age Hillforts. Give children the chance to research hillforts further, using the internet and books, including looking at different designs, different layouts and the varied materials used to construct them. Having researched hillforts, ask the children to create their own detailed drawing of a hillfort, focusing on accuracy and detail. They could include features such as walls, gates, houses, and other buildings within the fort. Additionally, they could use different colours or shading techniques to highlight important features or add depth to their drawings. As an extension, they could present their drawings to the class, explaining the features included and the reasons for their choices.

PLENARY

End the lesson by discussing how land clearance for farming, which began in the early Neolothic period, continued through the Bronze and Iron Ages. The clearance of large area of woodland for agriculture which began during these periods continued right up until World War II and shaped the landscape of the Sevenoaks Greensand Commons we see today.

HISTORY

Lesson 1 - Resource Sheet 1

Useful research links

NEOLITHIC PERIOD

- BBC History: Discovering Stone Age tools made of flint
- BBC History: Stone Age Farming and Homes
- BBC Bitesize: Life in Neolithic Stone Age
- History.com – Stone Age

BRONZE AGE

- BBC Teach – Bronze Age barrows
- BBC Bitesize – Life in the Bronze Age
- DK Findout! – Bronze Age

IRON AGE

- Oldbury Camp Iron Age Hillfort – Wikipedia
- Oldbury Hill – National Trust
- Kent Archaeological Society - Iron Age Hillfort at Squerryes
- DK Findout! – Iron Age Hillforts
- BBC Bitesize – Iron Age Hillforts
- BBC History – Iron Age Daily Life

HISTORY

Lesson 2

Roman roads and their impact on Sevenoaks Greensand Commons

Aim:

To investigate the Roman roads of the Sevenoaks Greensand Commons.

National Curriculum objectives:

- Pupils should be taught about the Roman Empire and its impact on Britain

Resources:

- Access to research material (internet, books, library).
- Road building materials (see Resource sheet 1).

Introduction

When the Romans arrived in Britain in AD43, they were met by a landscape which had already been shaped by human existence for thousands of years. The subsequent impact Roman occupation had on the British landscape, however, was significant with the effect and implications still visible today. One of the most notable changes to the British landscape came through the road network. There is evidence in the Sevenoaks Greensand Commons are for three main communication routes which were created for the purpose of trade and to connect markets with ports.

ACTIVITY 1

Roman Roads

When the Romans arrived in Britain in AD 43, they brought with them a sophisticated road-building technology and quickly set about constructing a network of roads that linked all parts of the country. In their nearly 400 years in Britain (AD43 – AD410) they built almost 2,000 miles of roads.

These roads were made from layers of stone, gravel, and sand, and were built to be wide and level, allowing for faster and smoother travel. This made it easier for the Romans to move their armies, trade goods, and administer the country. The Roman road network was so well-designed that many of these roads are still in use today, almost 2000 years later, demonstrating the long-lasting impact of Roman infrastructure on Britain's connectivity.

Children can learn the secrets of why Roman roads were so successful by building their own Roman road using the Roman road construction activity found on Resource Sheet 1.

HISTORY

Lesson 2

Roman roads and their impact on Sevenoaks Greensand Commons

ACTIVITY 2

A Roman Network

During the Roman period, a new and improved network of roads was laid down, and a number of these pass through or near the areas occupied by the Sevenoaks Greensand Commons. Initially this network was established for the use of the Roman military and generally linked ports, forts and urban centre but they came to be used by the local population for a variety of purposes, trade being one of the most important. Often the traffic passing along these routeways led to the development and the continued prosperity of the settlements that bordered them; it has been argued that all of the known Roman sites are within 3.5 km of a Roman road.

The most important Roman road in this landscape is that running between London and Lewes, passing just to the west of Westerham. It is likely that this road was originally constructed to connect London and Watling Street at its northern end, with the iron works of Sussex to the south. From Westerham, the road continues southwards where its passes Crockham Hill common on its southern and western sides and forms the south-western boundary of the Crockham Hill common.

The Roman roads of Britain can be further explored though the following website: The Rural Settlement of Roman Britain: an online resource (roman roads can be toggled on using the legend on the right-hand side of the page). Using laptops or tablets, give children time to explore the road network of Roman Britain, paying particular attention to the Westerham and Sevenoaks area of Kent.

Provide children with an outline map of Kent (see **Resource sheet 2**) or challenge them to draw their own outline on blank paper. Using the online map, ask children to draw the network of Roman roads in Kent.

PLENARY

The roads built by the Romans changed the way people living in the Sevenoaks Greensand Commons area lived and worked. They made it easier for the Romans to travel around the country and to move their armies quickly from one place to another. They also made it easier for people to trade goods and for soldiers to move supplies from one place to another.

The roads also affected the way the land was used. Before the Romans came, people mainly lived in small villages and worked on their farms. But the new roads made it easier for people to travel to towns and cities to trade and work, and so more people started living in towns and cities instead of in the countryside. Populations increased and with this came the need for more farming and agriculture. The land clearance, which began during Neolithic times (see History: Lesson 1) continued in earnest during the Roman period.

When the Romans arrived in Britain in 43 AD, much of the land was covered in dense forests and marshy areas, which made it difficult to cultivate crops or graze animals. The Romans saw the potential for the land and quickly set about clearing large areas of forests and draining wetlands to create more farmland.

Overall, the Romans played an important role in transforming the landscape of Britain: they built extensive road networks, cleared large areas of forests and marshland, introduced new crops and farming techniques, and created a legacy that can still be seen in the landscape today.

HISTORY

Lesson 2 - Resource Sheet 1

Constructing a Roman road

Roman road construction began by digging a shallow ditch. First, a layer of sand was added to create a firm and level base. Next, a layer of gravel was added. On top of the gravel was a layer of concrete, made from volcanic ash mixed with lime and seawater. The final layer was a layer of smooth stones to create a surface smooth enough for armies to talk on and carts to wheel over.

To create your Roman road, you will need the following:

- a shoe box lid (for the ditch)
- PVA glue
- sand
- gravel
- plaster of Paris
- large, smooth stones

Step 1:

Begin by spreading a layer of PVA glue over the entirety of the base of the shoe box lid and then spread a layer of sand over the glue, making sure the layer of sand is level. Leave to dry then shake off excess sand.

NB: From here on, each layer will be slightly shorter than the last, so that each layer is visible in the finished product.

Step 2:

Spread PVA glue across three quarters of the sand layer then place a layer of gravel on top of the glue. Create a 50:50 water:glue mixture and pour over the top of the gravel to hold it in place. Leave this to dry (preferably overnight).

Step 3:

Mix up the plaster of Paris as per instructions and cover half of the box with the plaster. The plaster here will represent the concrete.

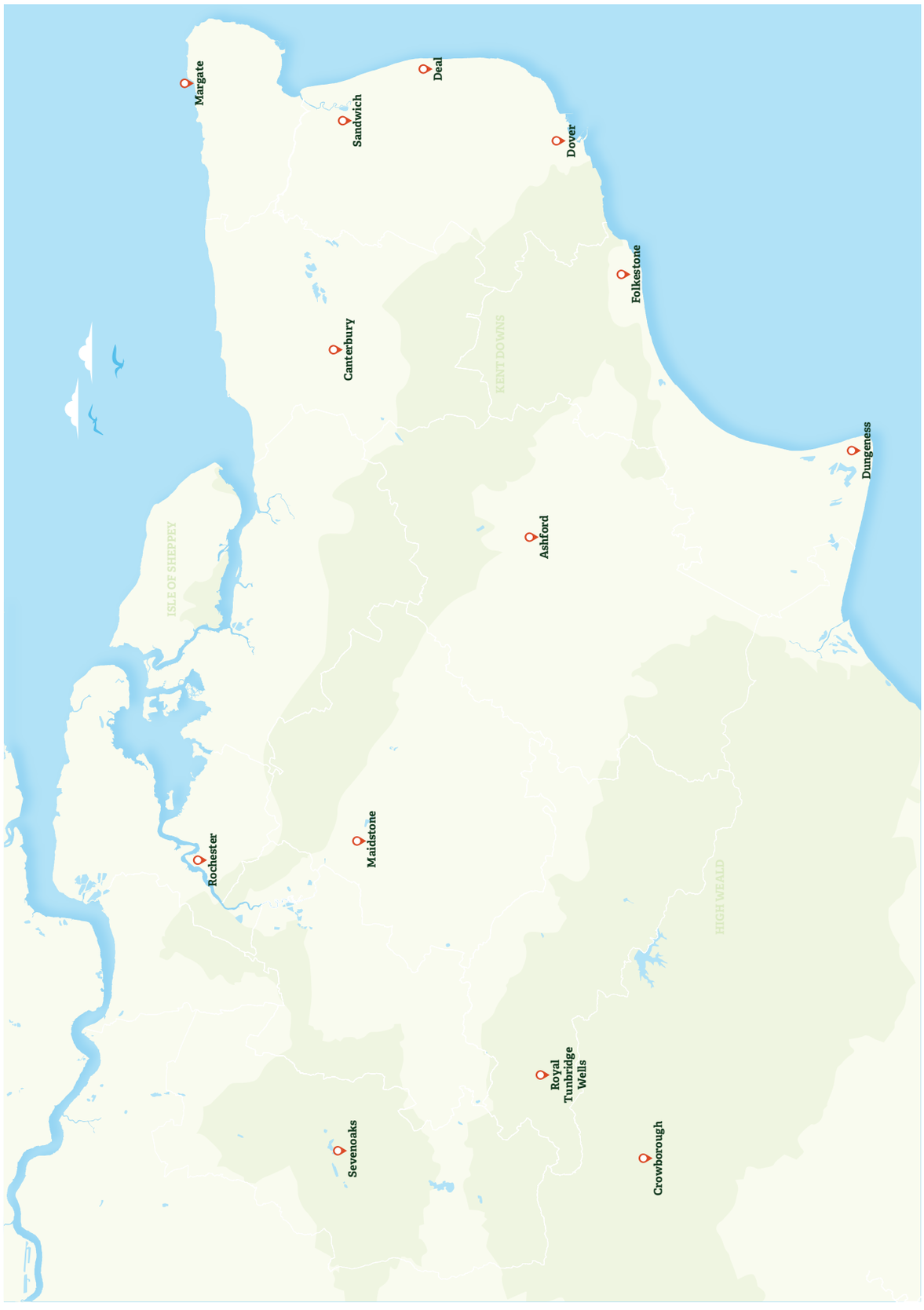
Step 4:

While the plaster of Paris is still soft, add the larger, smooth stones as paving stones. Work as carefully as possible to fill all the gaps, fitting the stones together like a jigsaw (the Romans would have cut the stones to ensure they fit together tightly).

HISTORY

Lesson 2 - Resource Sheet 2

Roman road network map



HISTORY

Lesson 3

Saxon settlements: village life on the Sevenoaks Greensand Commons

Aim:

To investigate Saxon village life on the Sevenoaks Greensand Commons.

National Curriculum objectives:

- Pupils should be taught about Anglo-Saxon settlements and kingdoms: place names and village life.

Resources:

- Maps and atlases (particularly of Sevenoaks Greensand Commons)
- Access to research material (internet, books, library)

Introduction

Following the departure of the Romans, from the early part of the fifth century people from the continent, mainly northern Germany and southern Scandinavia, started to settle in Kent. From the middle of the fifth century onwards they began to make an impact on the landscape, establishing settlements and dividing up the countryside, shaping the landscape we see in Kent today.

The relative infertility of the soil in the Greensand Commons (see Geography Lesson 1) led to an economy largely based on pastoral farming and transhumance. Seasonal transhumance (the practice of moving livestock from one grazing ground to another in a seasonal cycle) was a major feature of the Anglo-Saxon economy in the area and had an impact on the location and layout of the settlement and communication system. In particular, many of the north-south routes through the Greensand Commons, still apparent today, were set out in this period as droveways (a road or track along which livestock are regularly driven).

ACTIVITY 1

Transhumance and pannage

For around seven weeks of the year, in autumn, Saxon herdsmen would drive swine (pigs) over many miles into the woodlands around the Greensands Commons so that they could feed on acorns and beech mast (pannage). During this annual migration, the drovers set up temporary shelters in clearings called 'dens' across the area.

Transhumance was a significant part of village life for Anglo-Saxons living in the Sevenoaks Greensand Commons area. Ask children to read the information on transhumance in Resource sheet 1 and make notes to support their understanding. Tell children that they are going to be a doing a piece of creative writing on Anglo-Saxon transhumance; this could be in the form of a diary entry, a short story or perhaps even a poem. Provide children with Resource sheet 2 – A Day in the Life of a Saxon Swineherd – as a prompt for their own writing. If possible, give children the chance to roleplay their writing before putting pen to paper to encourage creativity.

At the end of the lesson, give children the chance to share their writing with the class, explaining why they have included certain elements in their own writing.

Why not take your learning outside!

Help the children put themselves in the shows of a swineherd by taking the children to one of the Sevenoaks Greensand Commons and walking through the woodland, where children could roleplay the practice of transhumance.

HISTORY

Lesson 3

Saxon settlements: village life on the Sevenoaks Greensand Commons

ACTIVITY 2

Anglo-Saxon Place Names

The Anglo-Saxons had a lasting impact on the Kent we see today, and nowhere is this more visible in everyday life than in our place names. Many of the place names in the Sevenoaks Greensand Commons region have their origins in Old English or Anglo-Saxon.

For example, the word Chart (old Norwegian Kart) appears in many local place names such as Seal Chart and Brasted Chart. The word Chart means “rough rocky soil” and reflects the poor soil quality of the area. Seal itself derives its name from the Old English words "Sael" meaning a hall or manor house.

The name Somerden still survives in farm settlements 6 miles west of Sevenoaks and translates to “summer pasture”; the area is linked by a series of droveways used by those Anglo-Saxon swineherds.

Otford, a village located a few miles east of Sevenoaks, derives its name from the Old English words "Ohta" meaning high and "Ford" meaning river crossing.

Even the name of the name Sevenoaks itself is derived from the Old English "Seouenaca," which means "seven oak trees".

Old Saxon place names often include prefixes and suffixes that reflect the features of the location and, with just a little detective work, you can easily decode the meanings of place names. Give children Resource sheet 3 and access to either a map or atlas (online resources such as Google Maps are useful here if available). Further information on Anglo-Saxon place names can be found on the English Heritage website.

PLENARY

Finish the lesson by recapping land use change in the Sevenoaks Greensand Commons. Remind children how the unique geology of the area led to poor soil quality which in turn influenced how man has used the landscape. Initially, stone age man and the Romans began clearing the land for agriculture but the poor soil quality meant pastoral farming prevailed. In this lesson, children will have learnt how Saxon swineherds continued to use the landscape for pastoral farming, driving herds of pigs through the commons during autumn to fatten them up on acorns.

The clearing of the trees and grazing of animals led to the development, over many hundreds over years, of the unique and treasured habitat present today: a mosaic of ancient woodland and heathland. It is a habitat which is home to a wide variety of plants and animals and is a habitat which needs protecting. In the next set of lessons, children will be discovering more about the ecology of the Sevenoaks Greensand Commons and learning more about the plants and animals that call this place home.

HISTORY

Lesson 3 - Resource Sheet 1

Transhumance information sheet

In Anglo-Saxon times, the region around the Sevenoaks Greensand Commons was home to many farming communities. These communities relied on agriculture for their livelihoods, and one of the most important aspects of their farming practices was transhumance.

Transhumance is the seasonal movement of people and livestock between different grazing grounds. In Kent, transhumance was a way for farmers to make the most of the available land by moving their animals to different pastures.

One important aspect of transhumance in this area during Anglo Saxon times was the practice of pannage. This involved allowing pigs to graze on the acorns and other nuts that fell from the trees in the forest during the autumn months. The pigs would eat these nuts, which provided them with a good source of food and helped to fatten them up before they were slaughtered for their meat.

The practice of pannage was an important part of the economy in the Sevenoaks Greensand Commons area during Anglo Saxon times. Many families in the area owned pigs, and they relied on the practice of pannage to provide them with meat and other products such as lard and bacon. The practice of pannage also helped to clear the forest floor of fallen nuts, which could be a fire hazard if they were left to accumulate.

During the autumn months, families would take their pigs into the forest to graze on the fallen nuts. They would mark their pigs with a special mark so that they could tell which pigs belonged to which family. The pigs were allowed to roam freely in the forest, and they would eat as much as they wanted. After a few weeks of grazing on the nuts, the pigs would have put on a lot of weight, which made them good for slaughtering.

Transhumance had many benefits for the farming communities of Anglo-Saxon Kent. By moving their animals between different pastures, farmers could avoid overgrazing and allow the grass to regenerate, which helped to maintain the health of the land. Transhumance also provided opportunities for social interaction and cultural exchange between different communities, as farmers would often meet and trade with one another during the journey.

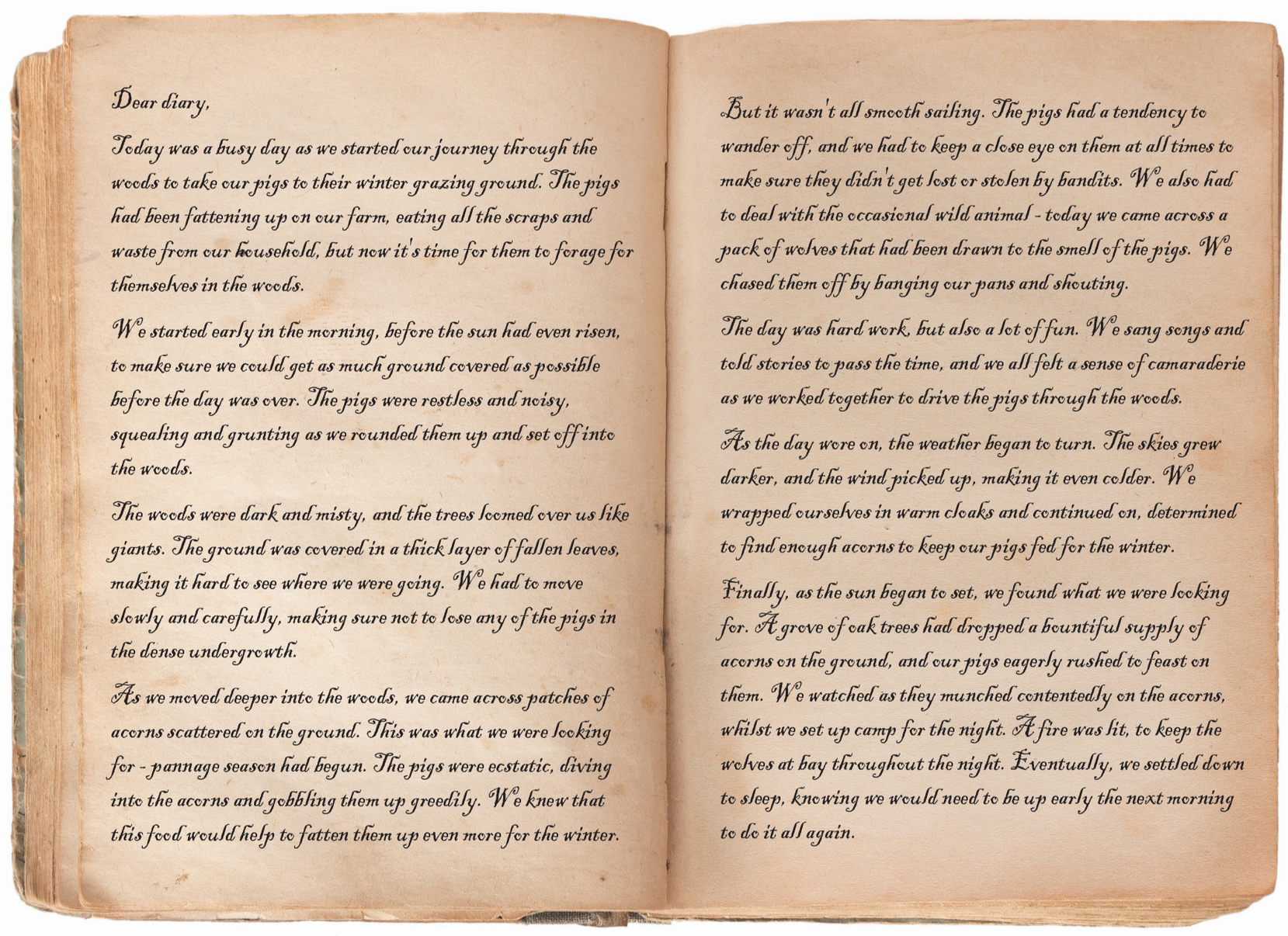
However, transhumance was not without its problems. The seasonal movement of animals could cause conflict with other land users, and there were also concerns about the spread of disease between different grazing areas. These issues led to the development of laws and regulations governing the movement of animals, which were designed to protect the interests of all parties involved.

In conclusion, transhumance and the practice of pannage were an important part of the economy in the Sevenoaks Greensand Commons area during Anglo Saxon times. They allowed families to raise pigs and other animals for food and other products, and they helped to clear the forest floor of fallen nuts. Although the practice of pannage is no longer common in the area, it is still remembered and celebrated by some people as an important part of the region's history and culture.

HISTORY

Lesson 3 - Resource Sheet 2

A day in the life of a Saxon swineherd



Dear diary,

Today was a busy day as we started our journey through the woods to take our pigs to their winter grazing ground. The pigs had been fattening up on our farm, eating all the scraps and waste from our household, but now it's time for them to forage for themselves in the woods.

We started early in the morning, before the sun had even risen, to make sure we could get as much ground covered as possible before the day was over. The pigs were restless and noisy, squealing and grunting as we rounded them up and set off into the woods.

The woods were dark and misty, and the trees loomed over us like giants. The ground was covered in a thick layer of fallen leaves, making it hard to see where we were going. We had to move slowly and carefully, making sure not to lose any of the pigs in the dense undergrowth.

As we moved deeper into the woods, we came across patches of acorns scattered on the ground. This was what we were looking for - pannage season had begun. The pigs were ecstatic, diving into the acorns and gobbling them up greedily. We knew that this food would help to fatten them up even more for the winter.

But it wasn't all smooth sailing. The pigs had a tendency to wander off, and we had to keep a close eye on them at all times to make sure they didn't get lost or stolen by bandits. We also had to deal with the occasional wild animal - today we came across a pack of wolves that had been drawn to the smell of the pigs. We chased them off by banging our pans and shouting.

The day was hard work, but also a lot of fun. We sang songs and told stories to pass the time, and we all felt a sense of camaraderie as we worked together to drive the pigs through the woods.

As the day wore on, the weather began to turn. The skies grew darker, and the wind picked up, making it even colder. We wrapped ourselves in warm cloaks and continued on, determined to find enough acorns to keep our pigs fed for the winter.

Finally, as the sun began to set, we found what we were looking for. A grove of oak trees had dropped a bountiful supply of acorns on the ground, and our pigs eagerly rushed to feast on them. We watched as they munched contentedly on the acorns, whilst we set up camp for the night. A fire was lit, to keep the wolves at bay throughout the night. Eventually, we settled down to sleep, knowing we would need to be up early the next morning to do it all again.

HISTORY

Lesson 3 - Resource Sheet 2

A day in the life of a Saxon swineherd

The tables below give examples of Old Saxon place name prefixes and suffixes and their meanings (definitions).

Use a map or an atlas to identify place names which include these prefixes or suffixes in your area and add them to the table (some have been done for you).

Old Saxon prefixes		
Hoo- HIGH, ELEVATED AREA	**Sta-** PLACE OR SITE	**Wic/Wich-** VILLAGE OR SETTLEMENT

Old Saxon suffixes		
-borough, -burgh and -bury FORTIFIED TOWNS	**-ford** RIVER CROSSING	**-ing** PEOPLE OR TRIBE

ECOLOGY

Lesson 1

Life cycles on Greensand Commons: mammals, amphibians, insects and birds

Aim:

To discover the life cycles of the animals of the Sevenoaks Greensand Commons.

National Curriculum objectives:

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

Resources:

- Card, scissors, glue, coloured pens and/or pencils.
- Access to research material (internet, books, library).

Introduction

Previous lessons in this education pack have highlighted how the unique geology of the Sevenoaks Greensand Commons, and the way that humans have used the land over the years, has led to the development of a rare and special habitat: one that needs to be protected. The patchwork of woodland and heathland which is the Sevenoaks Greensand Commons landscape is home to many of the UKs most loved creatures, as well as many of the UK's most vulnerable.

Begin the lesson by asking children if they can think of any animals they think might live in a habitat such as the Sevenoaks Greensand Commons. If possible, show children images of the commons (perhaps using Google Street view) to help them visualise the habitat. Introduce or recap the terms mammal, bird, insect and amphibian: ensure children understand the meaning (use **Resource sheet 1** to support).

Why not take this lesson outside?

If possible, take children to one of the Greensand Commons and take them for a walk around the site. What can they see? What can they hear? If there aren't many creatures around, can they find evidence of animals, such as feathers, animal droppings, footprints, birds' nests or half-eaten pinecones?

The Wildlife Trust has created many spotters sheets which may help children identify the animal and plant life they are seeing: or, children can create their own spotters sheets, based on what they expect to find.

Creatures of the Commons

Introduce the class to some of the animals which can be found on the Sevenoaks Greensand Commons. Use the information and the website links below to talk through examples of mammals, birds, amphibians and insect which can be found on the commons.

Mammals:

Round, brown and famously covered in spines, the hedgehog is the UK's most familiar wild animal and can be found on the Sevenoaks Greensand Commons. They love long grass full of insects to feast on once the sun has set. Another creature that comes out at night and calls the commons its home is the Hazel Dormouse. Dormice are barely ever seen due to the fact they spend most of the day asleep! At night they come alive, climbing high into the trees on the hunt for a tasty snack. Sadly, numbers of both the hazel dormouse and the hedgehog are in decline in the UK, mostly due to habitat loss and fragmentation.

Birds:

The sparrowhawk is the silent assassin of the woodland, swooping through the trees with agility and speed to catch it's unsuspecting prey of smaller bird species such as finches, sparrows and tits. Another bird of prey which can be found on the Commons is the tawny owl, although to see this one you'll need to come back at night, when you can hear pairs of owls calling to each other with their familiar "too-wit too-woo".

ECOLOGY

Lesson 1

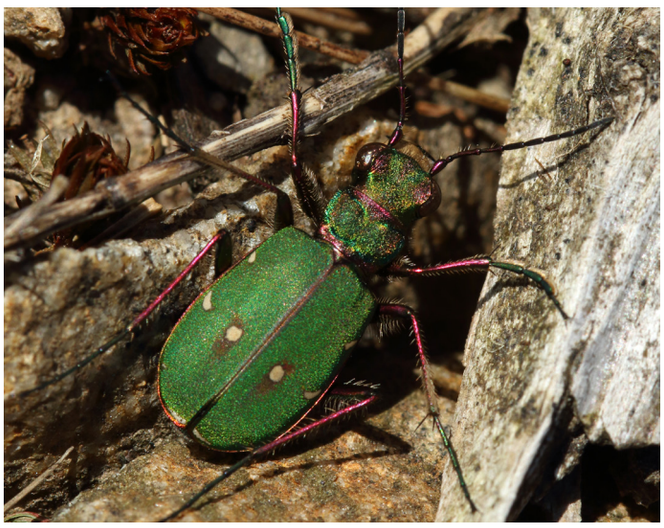
Life cycles on Greensand Commons: mammals, amphibians, insects and birds

Insects:
The White admiral butterfly admiral is a medium-sized butterfly found in shady woodlands, clearings and rides in late summer, making the Greensand Commons a perfect habitat for this beautiful and rare butterfly.

Wooded heaths, such as those found at Sevenoaks Greensand Commons, are home to a number of important indicator species such as Heath Tiger Beetle. The rare heath tiger beetle is a formidable predator, with large eyes and a fearsome pair of jaws.

Amphibians:
Our most well-known amphibian, the common frog is a regular visitor to the ponds and waters of the Sevenoaks Greensand Commons, where they feast on slugs and snails. In winter, they hibernate in pond mud or under log piles. Frogs are well known for their rafts of frog spawn which they lay in spring which then hatch to become tadpoles.

The smooth newt (or common newt) is another amphibian you could find at Sevenoaks Greensand Commons. Newts are amphibians, breeding in ponds during the spring and spending most of the rest of the year feeding on invertebrates in woodland, hedgerows, marshes and tussocky grassland.



ACTIVITY 1

Research and present

Having introduced children to some of the animals that live on the Sevenoaks Greensand Commons, have children investigate these creatures a little bit deeper. Split the class into groups and assign each group one of the animals discussed, ensuring that at least one group is covering each mammals, birds, insects and amphibians. Using the internet and text books, have children research the animals and create a poster and/or presentation on the animal. To support the children in their research, Resource Sheet 2 has some suitable question prompts.

Having completed their research have groups present their findings back to the class, sharing the knowledge gained on each of the species. If possible, open the discussion up into a question and answer session, carrying out further research to clarify where necessary.

ECOLOGY

Lesson 1

Life cycles on Greensand Commons: mammals, amphibians, insects and birds

ACTIVITY 2

Life Cycle Spinners

Having researched a range of species found on the Sevenoaks Greensand Commons, have children create a life cycle spinner to demonstrate the life cycles of the various animals. If this wasn't part of groups initial research, further investigation may be required. Share with children the BBC Teach clip on lifecycles.

Using **Resource Sheet 3**, cut out the two circles, including the reveal window on the second circle. The first circle will form the base onto which the information will be drawn/written. Using a rule, divide the circle into equal sections (the number of sections will depend on the number of life stages for that species).

Children will then need to draw and/or write a description of the different stage into the sections of the circle. Examples of stages are detailed below, but these too may differ by species:

- Mammal – embryo > young > adolescence > adult
- Bird – egg > chick > adult
- Amphibian (frog) – frog spawn > tadpole > froglet > frog
- Insect (butterfly) – egg > caterpillar (larvae) > chrysalis (pupae) > adult butterfly

The life cycle of an insect is one which may require further investigation or teacher support, as children will need to understand the difference between complete and incomplete metamorphosis.

Once the first circle has been completed, with the stages of the life cycle drawn and/or written, the top circle can be attached by putting a split pin through the centre of both circles. Children can be supported in this by placing a lump of blu-tac on the table and pushing the pin through the card into the blu-tac.

ECOLOGY

Lesson 1 - Resource Sheet 1
Glossary

Mammal:
A mammal is an animal that has fur or hair, breathes air with lungs, and feeds its babies with milk from the mother's body. Mammals can be found all over the world, from tiny mice to huge elephants. Some common examples of mammals include cats, dogs, cows, and humans. Unlike some other types of animals, mammals are warm-blooded, which means their bodies can regulate their own temperature.

Bird:
A bird is an animal that has feathers, a beak, and lays eggs. Birds are found all over the world, from tiny hummingbirds to giant ostriches. They have wings that allow them to fly or glide through the air, and their feathers help keep them warm and dry. Some common examples of birds include chickens, ducks, and sparrows.

Amphibian:
An amphibian is an animal that can live both on land and in water. They are cold-blooded, which means their body temperature changes depending on the temperature of their environment. Amphibians lay eggs, but instead of hatching into babies like birds or mammals, they develop into tadpoles that eventually metamorphose into adult frogs or toads. Some common examples of amphibians include frogs, toads, and salamanders.

Insect:
An insect is a small animal that has three body parts (head, thorax, and abdomen), six legs, and sometimes wings. Insects are found all over the world and come in many different shapes and colors. They are important for pollinating plants, decomposing dead material, and as a source of food for many other animals. Some common examples of insects include butterflies, ants, and bees.

ECOLOGY

Lesson 1 - Resource Sheet 2

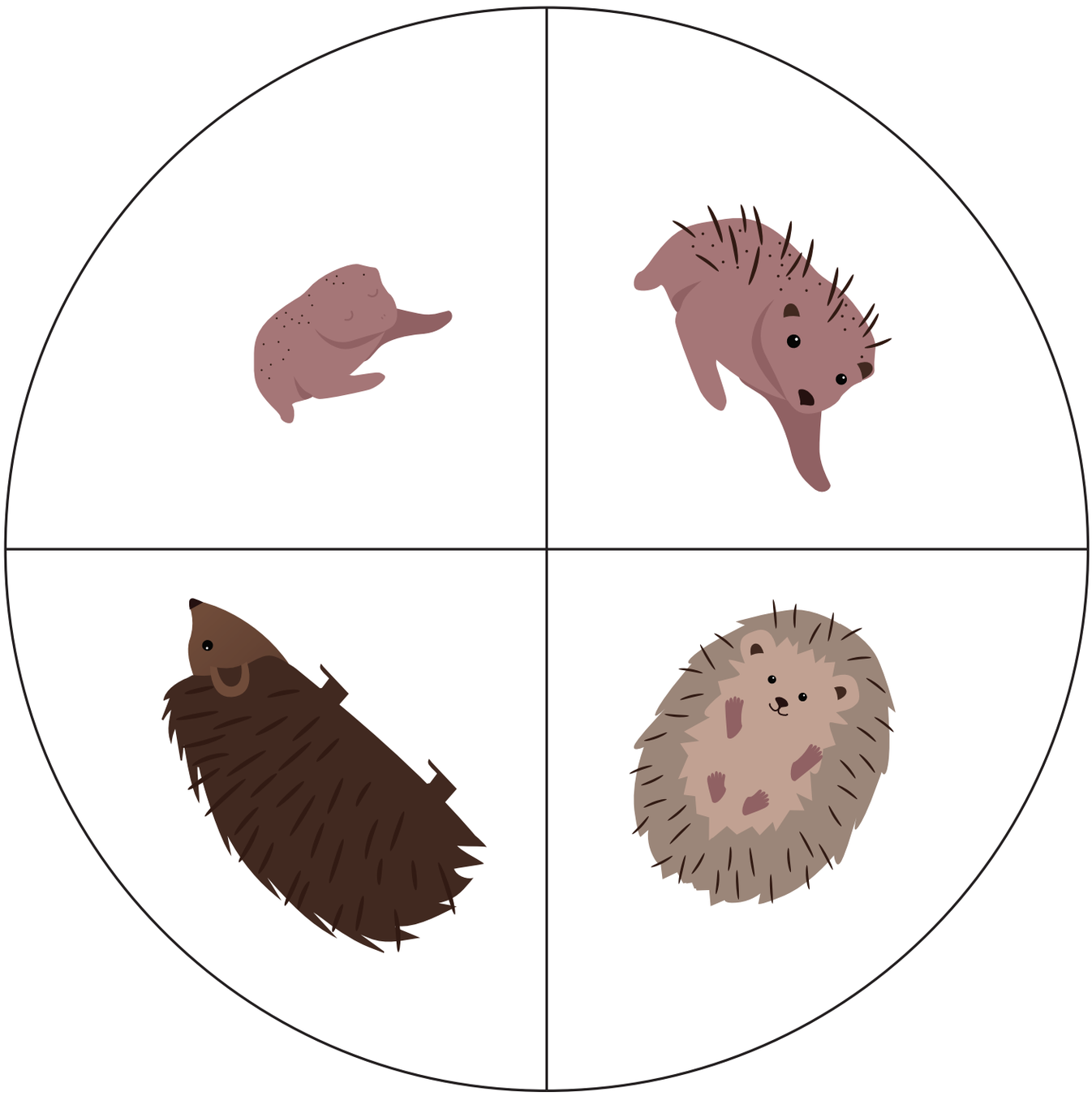
Research Question Prompts

1. What is the name of the animal?
2. What is the scientific classification of the animal?
3. Where does the animal live?
4. What is the habitat of the animal?
5. How is the animal adapted to its habitat?
6. What does the animal eat?
7. How does the animal obtain its food?
8. What are the physical characteristics of the animal?
9. What is the animal's behaviour?
10. How does the animal move?
11. How does the animal communicate?
12. Does the animal have predators? If so, what are they?
13. How does the animal defend itself?
14. What is the life cycle of the animal?
15. How does the animal reproduce?
16. How does the animal raise its young?
17. What is the status of the animal's population in the UK?
18. What role does this animal play in its ecosystem?
19. What are the threats to the animal's survival?
20. How can people help to protect the animal?

ECOLOGY

Lesson 1 - Resource Sheet 3

Life Cycle Spinners



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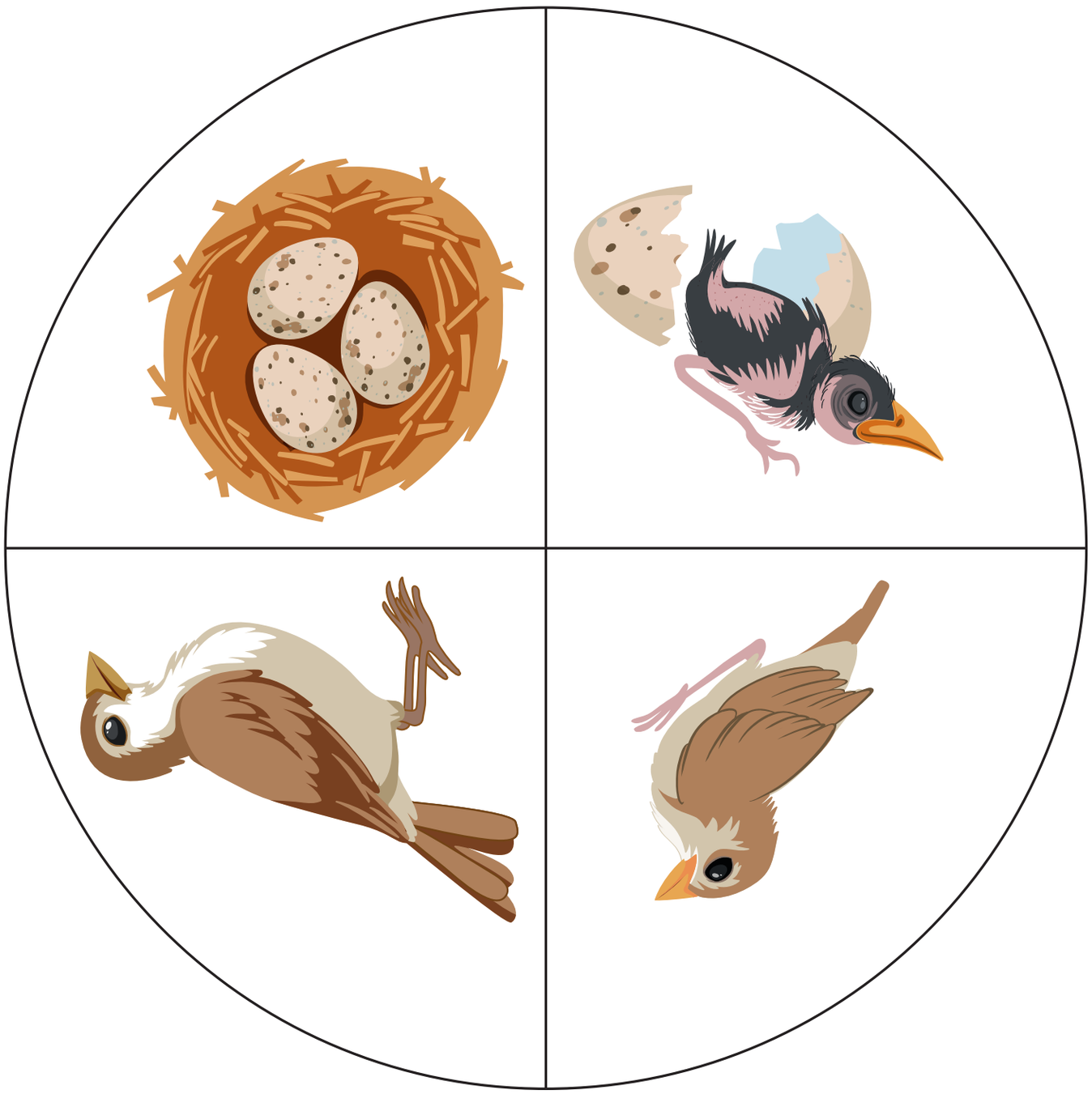
Lesson 1 - Resource Sheet 3

Life Cycle Spinners



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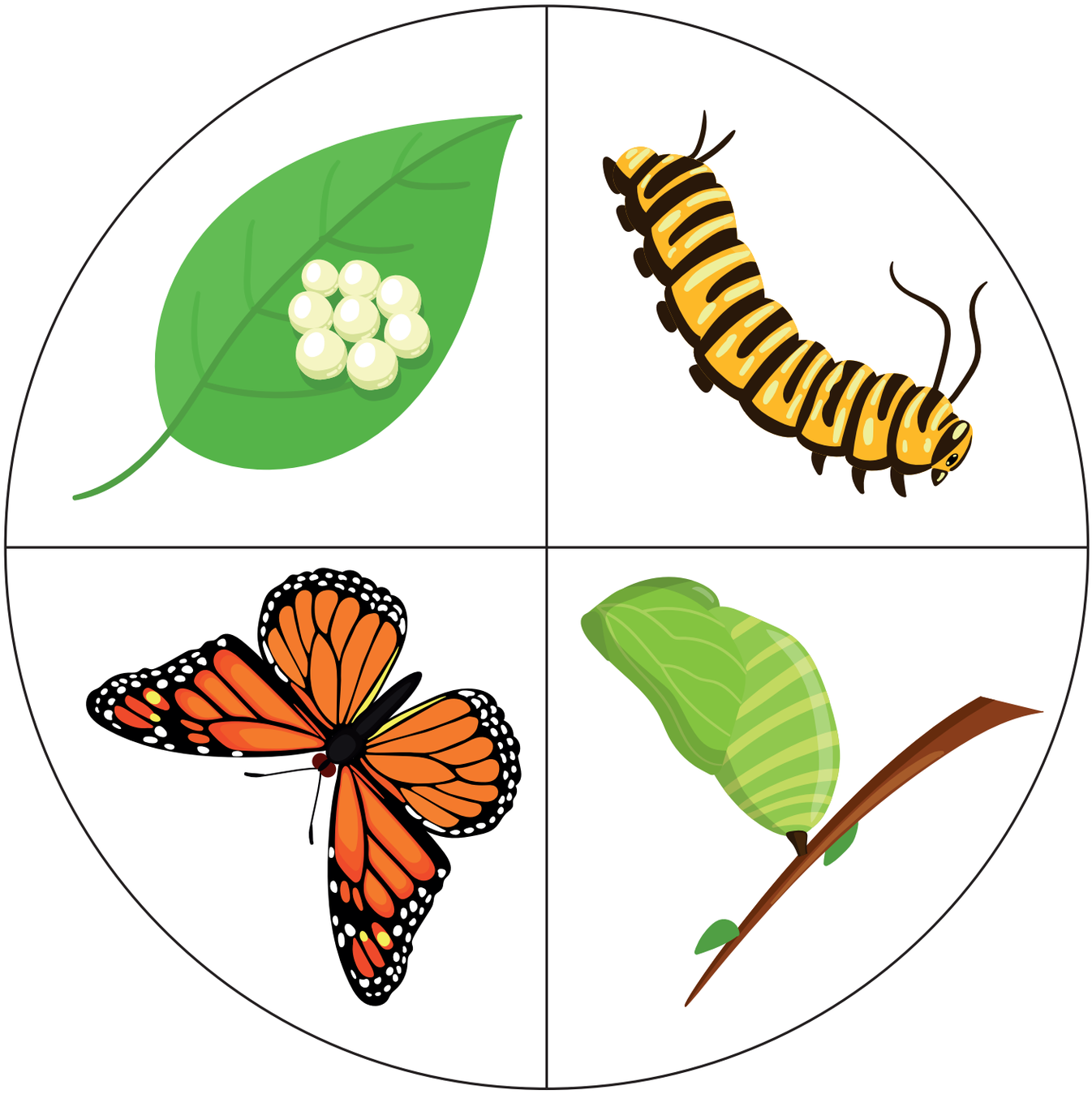
Lesson 1 - Resource Sheet 3

Life Cycle Spinners



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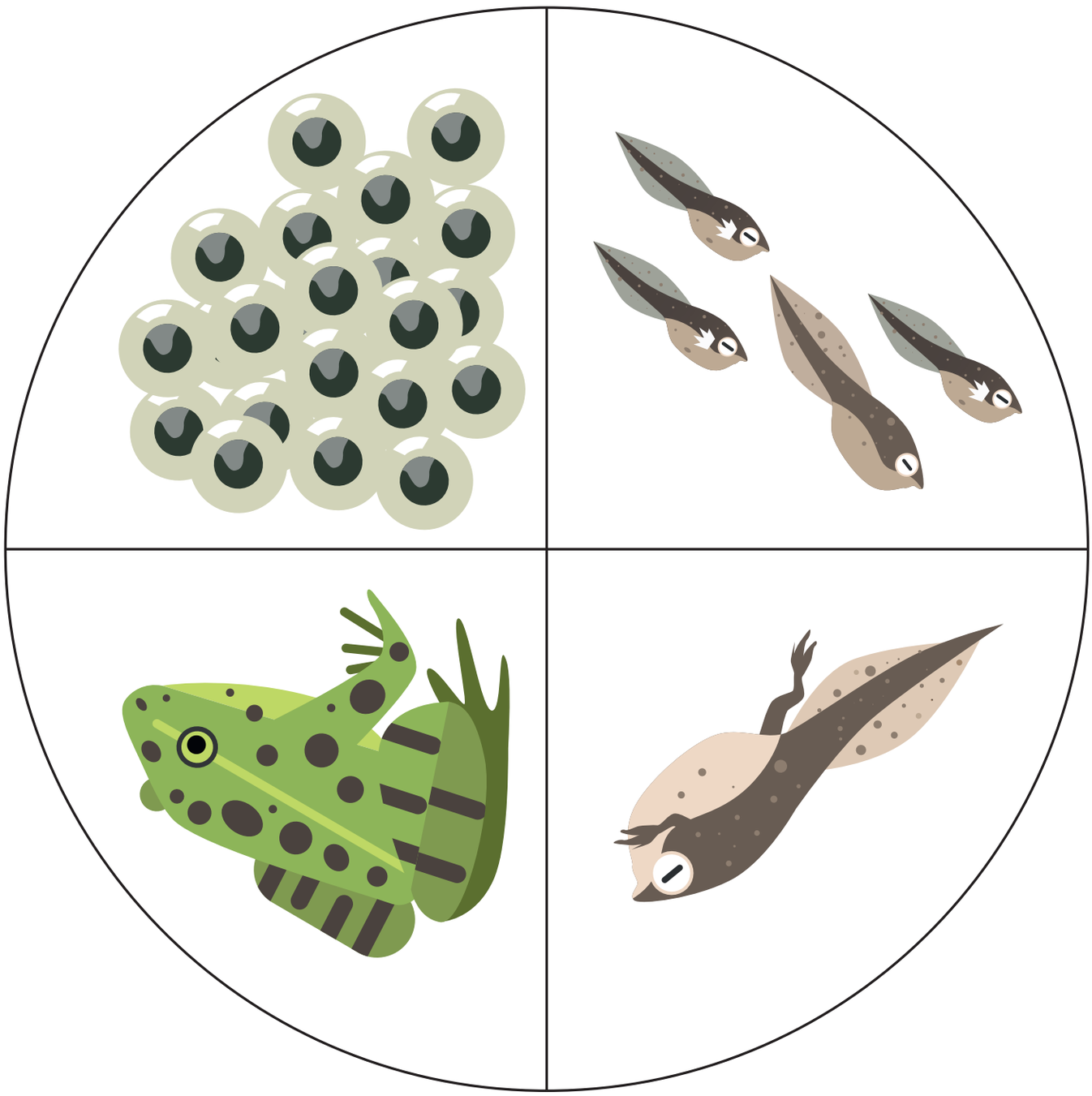
Lesson 1 - Resource Sheet 3

Life Cycle Spinners



ECOLOGY

Lesson 2

Producers, Predators & Prey of the Commons

Aim:

To construct and interpret food chains and food webs for animals of the Sevenoaks Greensand Commons.

National Curriculum objectives:

- construct and interpret a variety of food chains, identifying producers, predators and prey.

Resources:

- Card, scissors, glue, pens and/or pencils
- Access to research material (internet, books, library)
- A ball of string

Introduction

Begin the lesson by asking the children what they had for breakfast that morning. Use children's responses to create a simple food chain on the board.

For example, if someone had cereal write "cereal" on the board with an arrow pointing towards the word "child".

cereal → child

Explain that the bowl of cereal is where that child got their energy for the day and that the arrow in the food chain shows the "transfer of energy" from one living thing to another. The first organism in the food chain is always a "producer", which is an organism that makes its own food through photosynthesis (like plants). The next organism is a "consumer", which is an organism that eats the producer.

The cereal in the example above is a grass-like plant which produces grains. Ask the children where they think plants get their energy from. The answer is that all plants get their energy from the sun through a process called "photosynthesis". Add the sun to the simple food chain.

sun → cereal → child

ECOLOGY

Lesson 2

Producers, Predators & Prey of the Commons

ACTIVITY 1

Food Chains

Children will now be investigating some of the food chains found within the Sevenoaks Greensand Commons. Explain to children that consumers can be herbivores (plant-eaters), carnivores (meat-eaters), or omnivores (eat both plants and animals). Ask the students if they know what a predator and a prey are. Explain that predators are animals that hunt and eat other animals (prey).

Hand out sets of the cards found in **Resource Sheet 1** to the children. Begin by asking the children to sort the cards into producers (plants) and consumers (animals). Once sorted, ask the children to further sort the consumers into herbivores (plant-eaters), carnivores (meat-eaters), or omnivores (eat both plants and animals). Children might need support with this; encourage independent research by providing children with access to books or the internet.

Ask the children in groups to work together to build a food chain using the cards Encourage the children to use arrows to show the flow of energy from one organism to the next – a common misconception is for children to point the arrow the opposite direction to show "who eats who". Remind children that all food chains begin with the sun as the source of all the energy.

Encourage children to build food chains with multiple levels, like the example below. Explain that the first consumer is called the primary consumer, the second is the secondary consumer, the third is the tertiary consumer and the predator at the end of the food chain is known as an apex predator.

the sun (energy source) → **oak tree** (producer) → **caterpillar** (primary consumer) → **blue tit** (secondary consumer) → **sparrowhawk** (tertiary consumer)

Once the groups have completed their food chains, have them present their chains to the class and ask questions to check their understanding. You can ask them what each organism in the chain is and what it eats, and how energy flows through the chain.

ECOLOGY

Lesson 2
Producers, Predators & Prey of the Commons

ACTIVITY 2

Food Webs

Begin by holding up an image of one of the predators. Ask the class if they think the predator only predates on one prey species. Explain to the class that it is likely that one predator, such as the fox, may well predate on a number of different species, such as mice, voles, small birds and amphibians, and that the simplistic food chains the children have just constructed do not show the full complexity of the ecosystem.

Hand out one card from Resource Sheet 1 to each pupil and ask them to stand in a circle. Ask the children where all the energy in an ecosystem comes from: the sun. Hand the ball of string to the child holding the sun card. Ask where the energy will flow to next and then instruct the sun to pass the ball of string to one of the producers. Continue to pass the ball of string up the food chain, from producer to primary consumer, secondary consumer and so on until the apex predator is reached. At this point, cut the string and begin the process again, starting with the sun as the initial energy source. Repeat the process multiple times, taking as many different routes through the food chain as possible.

At the end of the activity, pause and reflect. Ask the children, whilst still holding their string, to describe what they have created – it should represent a web (similar to a spider's web) and will demonstrate the complexity of an ecosystem such as Sevenoaks Greensand Commons.

Encourage children to think about the different ways in which energy flows through the web, and how a change in one part of the web can affect many other parts. For example, if climate change were to mean that the Sevenoaks Greensand Commons was no longer a suitable habitat for English Oak. Warmer temperatures and reduced rainfall could increase the risk of drought stress, making the trees more vulnerable to pests and diseases. This would then affect species that rely on the oak, such as the caterpillar, which would have a knock on effect in the food web for all those who feed on the caterpillar.

To demonstrate this, ask the child holding the oak card to sit on the floor, still holding their pieces of string. The other children holding the other ends of those strings will feel a tug – this will be the stress caused through the loss of their food source. Ask those children to now also sit down, as loss of food (and therefore energy) has caused them too to die. Continue this up the food chain. Ask the children to reflect upon how the loss of one species can have a catastrophic effect on the rest of the ecosystem.

PLENARY

End the lesson by reflecting on the interdependence and fragility of the Sevenoaks Greensand Commons (and other habitats around the UK and the world). Discuss the importance of each and every species within that habitat, from the lowly caterpillar to the mighty sparrowhawk. Discuss some of the threats currently facing our habitats, such as climate change and habitat loss, and discuss with children the ways we can combat these threats.

See Kent Wildlife Trusts Actions website for ideas and take part in the Wilder Kent Awards to help us create a more biodiverse and climate resilient county.

ECOLOGY

Lesson 2 - Resource Sheet 1

Food chain & food web cards

ECOLOGY

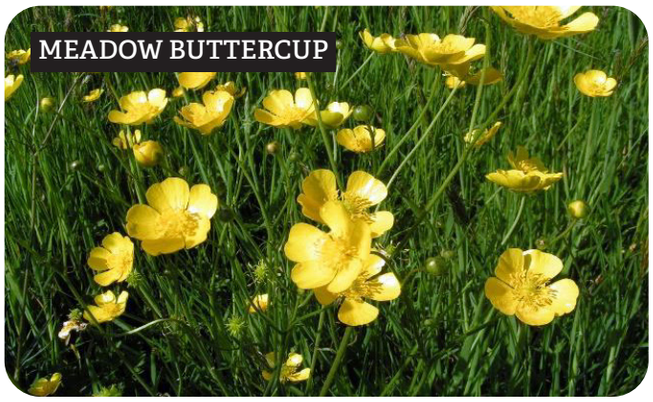
Lesson 2 - Resource Sheet 1

Food chain & food web cards - producers

BLUE BELL ©BEN HALL 2020VISION

ENGLISH OAK ©JIM HIGHAM

YEW ©BAMY LEWIS



MEADOW BUTTERCUP ©RICHARD BURKMAR

COMMON BIRDSFOOT TREFOIL ©PHILIP PRECEY

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Lesson 2 - Resource Sheet 1

Food chain & food web cards - consumers

CINNABAR CATERPILLAR ©ALAN PRICE2020VISION

CINNABAR MOTH ©RICHARD BURKMAR

GARDEN SNAIL ©JOHN BRIDGES

GREEN TIGER BEETLE ©JOHN BRIDGES

ANT ©JOHN SUTHERLAND

EMPEROR DRAGONFLY ©JANET PACKMAN

FIELD GRASSHOPPER ©JOHN SUTHERLAND

STAG BEETLE ©JTERRY WHITTAKER/2020VISION

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Lesson 2 - Resource Sheet 1

Food chain & food web cards - consumers

BLUE TIT©ABOB COYLE

DUNNOCK ©BOB DOYLE

LONG-TAILED TIT ©JOHN HAWKINS

NUTHARTCH ©GILLIAN DAY

GREEN WOODPECKER ©JOSHUA COPPING

MAGPIE ©AMY LEWIS

TAWNY OWL ©JOSHUA COPPING

SPARROWHAWK ©JON HAWKINS

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Lesson 2 - Resource Sheet 1

Food chain & food web cards - consumers

HEDGEHOG ©TOM MARSHALL

DORMOUSE ©DANNY GREEN

PIPISTRELLE BAT ©TOM MARSHALL

LONG-EAERED BAT ©TOM MARSHALL

MOLE ©STEVE BOTTOM

GREY SQUIRREL ©GILLIAN DAY

BADGER ©ANDREW PARKINSON2020VISION

FOX ©JON HAWKINS

ECOLOGY

Lesson 3

The Four Seasons at Sevenoaks Greensand Commons

Aim:

To observe seasonal changes in Sevenoaks Greensand Commons.

National Curriculum objectives:

- observe changes across the 4 seasons.

Resources:

- clipboards, paper and pencils.
- field guides or Wildlife spotter sheets.
- cameras, magnifying glasses, hand lenses and/or binoculars.
- art materials, including pencils, pens and paint.

Introduction

Let the children know that in this lesson they will be exploring the seasonal changes that occur in Sevenoaks Greensand Commons. Ask the children if they can name the four seasons. Write the four seasons in the four corners of the board and ask children to share any knowledge they have about the different seasons (this could be words or phrases associated with the seasons, descriptions of the seasons etc): create a word bank or working wall which can be added to throughout the lesson as knowledge improves.

Share with children the BBC Teach clip on the changing seasons. As you watch the video clip, pause occasionally to discuss the content and add new knowledge to the working wall on the board. Having watched and discussed the video clip, spend some time exploring seasonal wildlife through the Wildlife Trust's Wildlife Watch pages; this can be done together as a class or groups/pairs of children could be given time to explore the web pages independently.

The following pages on the Wildlife Watch site have a wide range of activities that you class could get involved in during the different seasons and would make great activities which would supplement this lesson, including nature treasure hunts, wildflower spotter sheets, wildlife spotter sheets and a range of things to make and do:

- Spring - a time when everything is growing and bursting into life. Birds are singing, leaves are unfolding, butterflies are starting to be seen and mammals are beginning to wake from their winter sleep.
- Summer - long summer days are full of life. Bees, butterflies and other amazing insects flit from flower to flower and baby birds chirp at their parents for food.
- Autumn - Crisp autumn days are full of colour as the leaves turn red and gold. Toadstools pop up from the floor like fairy-tale towers and animals fatten up eating brightly-coloured berries.
- Winter – *"I wonder if the snow loves the trees and fields, that it kisses them so gently?"* Lewis Carroll, Alice in Wonderland

ECOLOGY

Lesson 3

The Four Seasons at Sevenoaks Greensand Commons

ACTIVITY 1

Nature Walk

Begin by showing children images of the Sevenoaks Greensand Commons at different times of the year **(Resource Sheet 1)**. What do children notice? See if children can put the images in the correct order and describe the changes which have occurred from one season to the next. Winter might be a tricky one for younger children to recognise, as they may be used to seeing winter represented by snow and ice, but this opens up the opportunity for further discussions on weather and climate for this part of Kent.

If possible, take the students on a nature walk at Sevenoaks Greensand Commons (if this is not practicable, then the activity can be replicated in your school grounds or local area). Provide each student with one of the seasonal observation worksheets found on the Wildlife Watch pages and a clipboard. Ask them to observe the plants and animals they see and record their findings. If possible, provide children with magnifying glasses and binoculars to help with their identification. Throughout the walk, encourage children to think about how this landscape might look in different seasons: for example, if visiting in spring, how would the landscape look different in winter, if visiting in summer, what changes would children expect to see in autumn.

As an additional activity, children could spend time sketching the world they see around them – the use of coloured pencils – particularly in spring and autumn – would really help to highlight the differences between seasons. If children have access to technology, cameras or iPads to capture photos of the landscape will help to consolidate learning back in the classroom and support with **Activity 2**.

ECOLOGY

Lesson 3

The Four Seasons at Sevenoaks Greensand Commons

ACTIVITY 2

Seasonal Tree Art

Having spent time looking at and researching the seasons, children can finish the lesson by creating a piece of artwork to represent the different seasons, as seen at Sevenoaks Greensand Commons. **Resource Sheet 2** provides four tree outlines which children can use to decorate appropriate to the four seasons; for example, in spring they could add small leaf buds or blossom, in autumn with red, orange and browns etc. There are many ways this can be achieved, from using pen and pencils, to using paintbrushes or balls of cotton wool dipped in paint and then dabbed on to the paper to create foliage.

To support the children in their art, children could use the images in Resource Sheet 1 along with freeze frames from the BBC Teach clip and the photos and images gathered from their nature walk. Having finished their paintings, challenge children to embellish their art with other images associated with the different seasons. What animals might they expect to see in the different seasons? What might those animals be doing? What plants and flowers are they most likely to see? Snowdrops in winter and bluebells in spring etc.

Finish the activity by having children display their work on their desks and have the children move around the classroom looking at each other's work; they could leave positive feedback using post-it notes.

PLENARY

End the lesson with an activity reflecting on the four seasons. Ask the children to stand up out of their chairs and close their eyes. Tell the children that they are going to be using their imaginations to experience the four seasons at Sevenoaks Greensand Commons using their senses. Each season brings its own unique sights, sounds, smells, tastes, and feelings.

Begin with winter. Ask the children to close their eyes and picture winter on the commons. What would they feel? What would they hear? Give them prompts to support, such as the whistling wind, or the crunch of snow under foot. Gradually move on to spring. The children may wish to picture flowers blooming and hear the soft buzz of the bees and other pollinators going about their work. In summer, children may feel the warmth of the sun and listen to a breeze blowing gently through the trees. Move on to autumn, where crunchy leaves and the scurrying of squirrels dominates. End by returning to winter, so that children understand that the seasons are cyclical.

Looking for more?

If possible, this would be a great lesson to return to at different times of the year, perhaps arranging additional trips to the Sevenoaks Greensand Commons to experience first hand the changes that occur between the seasons.

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Lesson 3 - Resource Sheet 1

Seasonal images from Sevenoaks Greensand Commons

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Lesson 3 - Resource Sheet 1

Seasonal images from Sevenoaks Greensand Commons

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Lesson 3 - Resource Sheet 2

Seasonal trees

SPRING

SUMMER

AUTUMN

WINTER

Appendix

Generic Risk Assessment for Outdoor Learning

HAZARD	RESULTING INJURY/ILLNESS	ACTIONS TO REDUCE THE RISK
Sun	Sunburn, heatstroke, heat exhaustion, dehydration	Hat, sun cream, long sleeves, resting in the shade, drinking water.
Uneven ground	Slips, trips and falls	Sensible route. Sturdy footwear.
Insect sting	Swelling, allergic reaction	Care around insects, medical treatment if necessary.
Nettle Sting	Swelling and irritation	Care when walking. Long sleeves and trousers.
Crossing roads	Road traffic accident	Stay with adult, look both ways, cross quickly and safely.
Getting lost	Dehydration, hypothermia, tiredness	Stay with your adult or in your group. Carry a map and phone to call for help if lost.
Water (ponds, ditches, lakes, sea)	Drowning	Stay away from the edge of water unless supervised.
Mud	Slipping and falling, getting stuck	Avoid large areas of mud.
Poisonous plants	Feeling sick, allergic reaction	Do not pick and eat nuts, berries or mushrooms.
Cold weather	Hypothermia	Dress warmly and sensibly for the time of year. Wear waterproof and windproof clothes.
Dogs	Bites or being knocked down	Do not reach out to stroke a dog. Face the dog with hands across your body. Do not make eye contact. If knocked down, place arms over face and lie still.

Useful organisations and links

The project has, and continues to be developed and supported, with valued input from many organisations, including:

- Heritage Lottery Fund https://www.heritagefund.org.uk/
- Kent Amphibian & Reptile Group https://kentarg.org/
- Kent County Council
- Kent Downs AONB https://kentdowns.org.uk/
- Knole Estate https://www.nationaltrust.org.uk/visit/kent/knole
- Natural England https://www.gov.uk/government/organisations/natural-england
- Open Spaces Society https://www.oss.org.uk/
- Seal Parish Council https://sealparishcouncil.org.uk/
- Sevenoaks District Council https://www.sevenoaks.gov.uk/
- Sevenoaks Living Landscape
- Sevenoaks Society https://www.sevenoakssociety.co.uk/
- Sevenoaks Town Council https://sevenoakstown.gov.uk/
- Squerryes https://www.squerryes.co.uk/
- The Westerham Society http://www.westerhamsociety.org.uk/
- Westerham Town Council https://www.westerhamtowncouncil.gov.uk/
- Westerham Town Partnership http://www.visitwesterham.org.uk/community/town-council-partnership/town-partnership

kentwildlifetrust.org.uk

Contact Kent Wildlife Trust at **info@kentwildlife.org.uk** or call us on **01622 662012**

Kent Wildlife Trust, Tyland Barn, Sandling, Maidstone, Kent ME14 3BD

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