

Year 3 Science lessons pack

How can we identify native trees in autumn?

The Harmony Project

Year 3

Science lessons pack

ENQUIRY QUESTION

How can we identify native trees in autumn?

LINKED HARMONY PRINCIPLE

The principle of the Cycle

‘Each part of a tree helps to sustain its life cycle.’

The six lesson plans in this pack can be used to deliver the science content for the Year 3 enquiry of learning *How can we identify native trees in autumn?*, linked to the principle of the Cycle. This science learning builds on the foundations of the National Curriculum statutory requirements relating to plants and soils (see ‘Rocks’ section of the programme of study for Year 3).

Each lesson plan includes opportunities to refer to the children’s prior learning, as well as questions to use to reflect on current learning and to assess the children’s developing knowledge and understanding. In addition, lessons feature key elements that are distinctive to the Harmony approach to teaching and learning, for example: opportunities to **learn about Nature,** to **learn in Nature** and to **learn from Nature.**

A summary of these elements in relation to the six lesson plans in this pack is set out on the following pages.

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01 - Learning about Nature

The statutory requirements of the National Curriculum set out what children need to learn about Nature – although, of course, their wider learning about Nature will extend beyond this.

As children progress through their primary education, we can map the journey that their science learning about plants takes.

By understanding their prior learning about plants in the EYFS and Years 1 and 2, and by looking ahead to the path their learning about plants will take in Years 4, 5 and 6, we are better able to plan for progression.

The table below shows where the science learning about plants covered in the lesson plans in this pack sits within this journey.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
ENQUIRY	**Understanding the world**	**Which is my favourite wildflower and why?**	**What can I discover about different plants?**	**How can we identify native trees in autumn?**	**What do the indigenous cultures of North America teach us?**	**How can we restore our UK habitats back to health?**	**Where do we find beauty in Nature?**
SUMMARY OF LEARNING	Children will be guided to increase their knowledge and sense of the ecologically diverse world around them. They will explore the natural world, describe what they see, hear and feel while outside, recognise some environments that are different from the one in which they live and understand the effect of changing seasons.	Children will learn to identify different types of flowers, including local wildflowers, and trees, including deciduous and evergreen trees. They will learn the different parts of a plant, including leaves, flowers, fruit, seeds, roots, bulb, trunk, branches and stem.	Children learn about the needs of a plant, including water, light and temperature. They will begin to describe how seeds and bulbs grow into mature plants.	Children develop their knowledge of the needs of plants to include healthy soil and nutrients. They will recap the structure of a plant and learn the function or job each part of the plant has. Children investigate how water travels around the plant.	Children explore and use classification keys to help group, identify and name a variety of plants and animals. They will learn about potential dangers to living things when environments change. Children learn about the role of plants as producers within a food chain.	Children explore how plants reproduce, including seed dispersal and pollination, and learn about photosynthesis in simple terms.	Children will continue their understanding of classifying plants according to common observable characteristics and based on similarities and differences. They will also give reasons for classifying plants based on specific characteristics.
KEY VOCABULARY	flower tree seed bulb leaf plant fruit seasons blossom petal	deciduous evergreen wildflower roots branches stem trunk nectar pollen	germination pollen pollination soil	flowering plant nutrients bark twig trunk seed dispersal	food chain producer environment ecosystem	photosynthesis reproduction	classification characteristics adaptation evolution

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The table below sets out what the children's learning about plants will look like over the course of the six science lessons.

Week 1	Week 2	Week 3
Is a tree a plant? How do we know?	**What makes healthy soil? How does a plant grow?**	**How is water absorbed and transported through a plant?**
Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	Recognise that soils are made from rocks and organic matter	Investigate the way in which water is transported within plants

Week 4	Week 5	Week 6
Why are a tree's leaves so important?	**Where do fruits and seeds come from?**	**What can we learn from an apple tree?**
Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant



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02 - Learning in Nature

In addition to learning about Nature, a Harmony approach also provides suggestions for rich opportunities to learn in or alongside Nature, as the six science lessons in this pack demonstrate.

For example, the children have opportunities to learn in a natural setting to explore and name the parts of real trees and flowering plants in the local area, to collect soil samples to better understand its composition and to gather leaves to observe their structure. Other activities, such as planning an investigation to observe how water is absorbed and transported through a plant, would work well in an outdoor area or within a classroom setting.

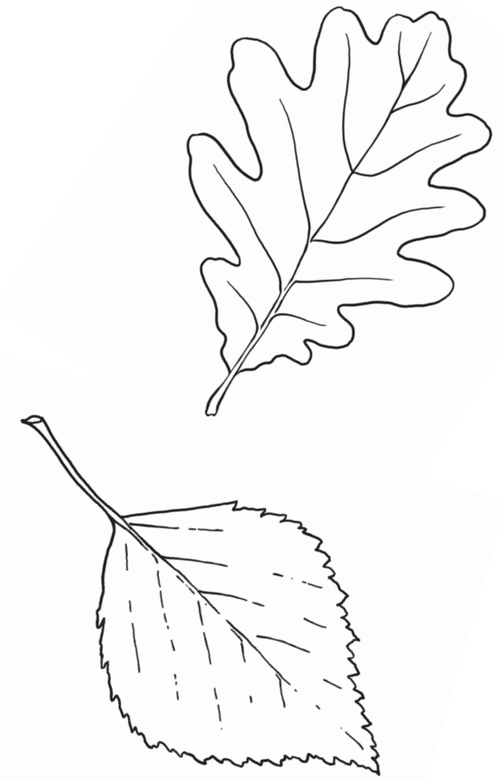
As they learn in or alongside Nature, the children also have opportunities to develop their science skills relating to the statutory requirements of the National Curriculum for working scientifically. Although these skills will be developed incrementally over time (as shown in Appendix A), the coverage of these skills within the sequence of these six lessons is set out below.

Week 1	Week 2	Week 3
Is a tree a plant? How do we know?	**What makes healthy soil? How does a plant grow?**	**How is water absorbed and transported through a plant?**
Recording findings using simple scientific language, drawings and labelled diagrams	Identifying differences, similarities or changes related to simple scientific ideas and processes	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
Scientific enquiry type: Identifying, classifying and grouping	Scientific enquiry type: Identifying, classifying and grouping	Scientific enquiry type: Observing over time

Week 4	Week 5	Week 6
Why are a tree's leaves so important?	**How do flowers become fruits?**	**What can we learn from an apple tree?**
Recording findings using simple scientific language, drawings, labelled diagrams	Identifying differences, similarities or changes related to simple scientific ideas and processes	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
Scientific enquiry type: Research using secondary sources	Scientific enquiry type: Identifying, classifying and grouping	Scientific enquiry type: Pattern seeking

Working scientifically vocabulary

- observe
- record
- present
- predict
- measure



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03 - Learning from Nature

The third key element of a Harmony approach to learning is learning from Nature, which is linked to progression in understanding of Harmony principles. This aspect of learning supports the development of children's understanding of what it means to live sustainably.

The six lessons in this pack and the wider enquiry they are part of are underpinned by the principle of the Cycle; they build on children's prior learning in the EYFS and Years 1 and 2 and prepare them for their learning in Years 4, 5 and 6.

The children's progression in their understanding of the principle of the Cycle and how it helps us to think and live more sustainably, through their exploration of six enquiries of learning, is shown below.

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
ENQUIRY	Children are introduced to opportunities to explore and develop their initial knowledge and understanding about cycles (when leaves fall from trees, when day turns to night, what we notice around us in each season and life cycles)	**Which is my favourite wildflower and why?**	**Why should we reduce, reuse and recycle?**	**How can we identify native trees in autumn?**	**What are the cycles of our solar system?**	**What journey does a river take from source to sea?**	**Where do migratory animals travel to and from, and why?**
PROGRESSION: CONCEPT OF THE CYCLE		What is the life cycle of a wild flowering plant?	What do I throw away and where does it go?	What is the life cycle of a tree?	How does our solar system work in cycles?	How does water work in cycles?	How is migration cyclical?
THINKING SUSTAINABLY		Why should we let wildflowers grow?	How can thinking in cycles help us to live more sustainably?	How do trees sustain themselves?	What are the benefits of solar energy?	How do our actions impact the water cycle?	Why is migration a cycle in Nature? Why do humans migrate?
THINKING SUSTAINABLY VOCABULARY	life cycle season pattern rhythm routine	growth rest cycle seeds habitat	waste recycle reuse reduce consume	abundance decline restore regenerate self-sustain decay	cyclical sustainable pollution fuel harness	responsibility finite resources solution replicate drought flood	agency impact circular economy conserve

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Lesson

01

Enquiry question:
How can we identify native trees in autumn?

Harmony principle:
The principle of the Cycle

NC Links

Plants
Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers; explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant

Working scientifically: Record findings using simple scientific language, drawings and labelled diagrams

Scientific enquiry type:
Identifying, grouping and classifying

Is a tree a plant? How do we know?

What do we already know?

Begin the lesson by recapping the children's prior **learning about Nature**. Using a real flowering plant or a picture of one, ask them to name as many of its parts as they can, drawing on what they already know.

Look at a tree or a picture of a tree alongside a flowering plant or an image of one. Ask the children: *Is a tree a plant? Why do you think this?*

Begin to draw out similarities and differences between trees and other flowering plants, such as appearance and the names of their parts e.g. size, lifespan, the use of the words 'stem' or 'trunk', 'branch' and 'bark'.

Key vocabulary

Vocabulary relating to plants, working scientifically and thinking sustainably is highlighted within the unit introduction.

What are we learning today?

Move the children's **learning about Nature** on by asking them: *Do you know what each part of a plant or tree does?* Provide the children with word cards showing the names of parts of a plant or tree and word cards with descriptions of their function (see Resource 1A).

Working in pairs, the children match each word card featuring the name of the part of a tree with the correct word card featuring a description of its function. Give children time to share their thinking with the class and clear up any misconceptions.

Ensuring each word card is paired with the correct description, the children glue these on to a sheet of paper in two columns. They will need this sheet for their outdoor activity.

You will need

Children will need to see real plants and trees for this lesson. If this is not possible within school grounds, this could be facilitated by arranging a visit to a local park, garden or garden centre or by going on a local walk.

Copies of Resource 1A (one per group)

How are we learning today?

Take the children outdoors to **learn in Nature**. If there is a local park or woodland close by, you may be able to go there.

Using their sheet with the names of the parts of plants or trees and the matching descriptions, the children work in pairs to identify each part of a tree, ticking them off on their sheet as they go. Ask them: *Do all the leaves look the same? Do all the trunks look the same? Can you see any tree roots?*

TIME TO EXPLAIN:
The children draw a tree and label it, using the names of the parts of a tree on their sheet for support, if necessary. Ask them: *What is the job of each part of the tree? How do you think the tree might look at different times of year?*

STEM SENTENCE:
When I compare the _____ of the plant with the _____ of the tree, I notice _____ .
e.g. When I compare the stem of the plant with the trunk of the tree, I notice that the trunk has bark, which is brown and rough, but the stem is green and smooth.

Give the children time to share their tree drawings with others before moving their **learning about Nature** on by asking them: *What do you think trees and plants need to stay healthy?*

In pairs, the children work through the BBC Bitesize 'What do plants need?' resources.

TEACHER TIP:
If following the Harmony Curriculum, children will be able to revisit National Curriculum content for science in Year 3 that relates to plants during the summer term. They will be able to work scientifically at an ideal time to investigate the conditions required to grow flowering plants as part of the learning enquiry *Where does our food come from?*.

Ask the children: *Where do you think a plant gets its nutrients from?*

Briefly discuss how a plant's nutrients come from the soil to link to the learning in the next lesson in this unit.

Adapt the learning

Children requiring additional support could cut out and use the word cards in Resource 1A as labels.

Challenge children to add their own description of each part of the tree to their diagrams.

What have we learned today?

Encourage the children to reflect on their **learning about Nature**, and assess their understanding, by asking: *Is a tree a plant? How do we know? What part of the tree anchors it in the ground? How does the trunk help the tree to grow? What is the job of the leaves?*

Draw out the **learning from Nature** by discussing as a class the importance of each part of the tree for the tree's survival. Ask the children: *Could the tree survive without its trunk? Why or why not? Could it survive without its roots?*

Discuss how, like the tree, the different parts of our bodies do different but essential jobs throughout our own life cycle.

Link the learning

CLIMATE ACTION PLAN:
Biodiversity

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Resource 1A

roots	This part uses sunlight to create food for the plant or tree. It also absorbs carbon dioxide to keep the planet healthy.
trunk or stem	These anchor a plant or tree in the soil and absorb water and nutrients from the soil.
leaf	This is the part of a plant or tree that makes seeds to grow new plants.
branch	This supports a plant or tree so that it stays upright. It transports water and nutrients from the roots to the leaves.
flower	This supports the canopy (the leafy top of the tree). It also transports water and nutrients from the trunk to the leaves.

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Lesson

02

Enquiry question:
How can we identify native trees in autumn?

Harmony principle:
The principle of the Cycle

What makes healthy soil? How does a plant grow?

NC Links

Rocks and soil
Recognise that soils are made from rocks and organic matter

Working scientifically: Identify differences, similarities or changes related to simple scientific ideas and processes

Scientific enquiry type:
Identifying, grouping and classifying

Key vocabulary

Vocabulary relating to plants, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Soil samples (or equipment to collect soil samples)

Trays

10 transparent containers with a tight-fitting lid

Spoon or small trowel

Magnifiers

Water

The Natural History Museum has images of different types of soil and a flow diagram to support children in identifying which type of soil they are investigating.

Adapt the learning

Children requiring additional support can use the class word list (created at the beginning of the lesson).

Challenge the children to explain the main components of healthy soil.

Link the learning

CLIMATE ACTION PLAN:
Biodiversity; Decarbonisation

What do we already know?

Begin the lesson by recapping the children's prior **learning about Nature**; they will have had experience of digging in soil, planting seeds and observing what lives in soil.

Year 3 is the first year that children formally investigate soil and explore its composition as part of the National Curriculum.

Ask the children: *What is soil? What lives in the soil? Why is soil important?* Gather their initial thoughts; these can be referenced again towards the end of the lesson to see how their understanding has developed.

What are we learning today?

Move the children's **learning about Nature** on by asking them: *What is soil made from?* Use magnifiers to explore the appearance and texture of soil, ideally by digging up soil outdoors and spreading it in a tray to observe. If this isn't possible, the children could examine previously collected soil samples in a tray.

Record their observations in a class word list, for example: dirt, earth, mud, worms, crumbly, dusty, dark, stones, organic matter. Introduce the idea that soil is also made up of air, which can't be seen.

Discuss where the organic matter in soil comes from (dead plant matter) and where mineral matter like stones and sand comes from (rocks break down over time).

Ask the children: *Which part of the plant do we find in the soil? Why is the relationship between the soil and the roots so important?*

Establish that a plant's roots are located in the soil, that they take in water and nutrients, which the plant needs to survive, and that they anchor the plant in the soil. Draw out in discussion the fact that we rely on soil health to grow and produce our food.

Extend the children's thinking by asking them: *What would 'healthy' soil be like? What would 'unhealthy' soil be like? If an apple tree is growing in unhealthy soil, what will happen to the apples? Do we ever eat the roots of a plant?*

TEACHER TIP:
Although we can't see or hear it, trees in a local area communicate – and even work together – via their root systems. The BBC News clip *How trees secretly talk to each other* on YouTube helps to explain this. You might also find the article *Do Trees Talk to Each Other?* from Smithsonian Magazine useful background reading. It references the book *The Hidden Life Of Trees: What They Feel, How They Communicate* by Peter Wohlleben.

How are we learning today?

Ask the children: *How can we tell if soil is healthy? What should we see in it?* Draw out the fact that we would want to see organic matter (such as leaf mulch) and living things in the soil, particularly worms.

Demonstrate how to make a soil shake using the soil samples that the children have already collected or worked with in this lesson. Half-fill with water a wide-necked, transparent container with a well-fitting lid and add a large spoonful of soil. Screw the lid on tightly and shake vigorously to combine, then leave to settle. Discuss how some things sink into layers, while others float.

Ask the children: *Are the layers clearly visible?* Due to differing particle size, the bottom layer will be sand, the middle silt and the top clay. The largest layer will indicate the general soil type.

Working in threes, the children make their own soil shake and discuss their conclusions. Add any other useful words that have come up in discussion to the class list of soil vocabulary (e.g. silt, sand, clay).

TIME TO EXPLAIN:
The children use a labelled diagram to record what they could see when their soil shake settled, drawing on the class list of soil vocabulary for support, if necessary.

STEM SENTENCES:
As the soil settles, I observe _____ .
Healthy soil should contain _____ .

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What have we learned today?

Draw out the **learning about Nature**, and assess the children's understanding, by asking: *What should we find in healthy soil? Why is soil important?*

Discuss with them the link between this learning and the **principle of the Cycle** e.g. dead leaves fall to the ground in autumn and break down to enrich the soil with organic matter, providing nutrients to other plants through their roots. Make the link with the children that soil is important in supporting all stages in the life cycle of plants and trees.

Ask the children: *Should we tidy up leaves when they fall? Why or why not? Does Nature have waste? How does this relate to waste and recycling in our own lives?*

Discuss the fact that seeds, nuts and fruits also fall to the ground in autumn. Some will grow into new trees and plants and some will provide food for animals. This is a great example of how everything in Nature works in relationship.

End the lesson by discussing the quote: *'The nation that destroys its soil destroys itself'* by Franklin D. Roosevelt. Ask the children: *What do you think he meant?*

TEACHER TIP:
There is an opportunity to address the common misconception that trees die in autumn when they lose their leaves; they are actually conserving energy and resources for the winter ahead.



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Lesson

03

Enquiry question:
How can we identify native trees in autumn?

Harmony principle:
The principle of the Cycle

How is water absorbed and transported by a plant?

NC Links

Plants
Investigate the way in which water is transported within plants

Working scientifically:
Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Scientific enquiry type:
Observing over time

Key vocabulary

Vocabulary relating to plants, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

Celery with leaves

10 plastic glasses

Water

Blue or red food colouring

Copies of Resource 3B for any children requiring support

Adapt the learning

Children requiring additional support could use the word bank on Resource 3B

Challenge children to create a class plant watering guide that explains how water travels from the soil to the leaves.

Link the learning

CLIMATE ACTION PLAN:
Biodiversity

What do we already know?

Begin the lesson by recapping the children's prior **learning about Nature** by asking them: *How do the roots help a plant or tree? What is the function of the stem or trunk?*

What are we learning today?

Establish that the stem of a plant or the trunk of a tree transports water and nutrients from the roots to the leaves, and sugars (made in the leaves using sunlight, carbon dioxide and water) from the leaves to the rest of the plant.

Discuss how stems support leaves, flowers and fruits, and tree trunks support a tree's branches. You could take the children outdoors to push against the trunk of a very large, established tree, if there is one nearby, to see how sturdy it is!

Begin to draw out the similarities between plants and people. Ask: *What in our own bodies supports us? (e.g. our skeleton)*

Move the children's **learning about Nature** on by asking them: *Do we ever eat the stems of plants?* Give celery, tenderstem broccoli, rhubarb and asparagus as examples of edible stems – and discuss any others they know of. Focusing on celery, draw out some features that make it identifiable as a stem (use the image on Resource 3A to support this discussion).

How are we learning today?

This part of the lesson could take place outdoors. Explain to the children that they are going to set up an investigation to observe how water travels up the stem of a plant. Introduce the word 'xylem' and discuss how these tiny tubes within the stem allow water and nutrients to travel to the leaves of the plant.

Working in threes, the children set up their investigation following these instructions:

1) Half-fill a glass with water.
2) Add a few drops of food colouring to the water.
3) Cut the stem from the base of the celery.
4) Place the stem in the glass.

TEACHER TIP:
It can take 24 hours for food colouring to travel up the stem, so this needs to be considered when planning this session.

However, if celery stems are left to wilt a little and then placed in coloured water during the lesson, the food colouring will move up the stem and into the leaves much faster.

TIME TO EXPLAIN:
Give the children time to draw the 'before' pictures from their investigation and make predictions. Once the investigation is complete, the children can draw 'after' pictures to show what happened. Ask them: *What happened and why?*

STEM SENTENCES:
I predict that _____ .
I observed that _____ .
Water and nutrients travelled up through the xylem (tiny tubes) in the_____ to the _____.

What have we learned today?

Encourage the children to reflect on their **learning about Nature**, and assess their understanding, by asking them to answer the learning question for this lesson: *How is water absorbed and transported by a plant?*

Draw out the children's **learning from Nature** by discussing with them that, just like a tree, we also need to make sure we drink enough water to stay healthy – something it's easy to forgot to do.

To end the lesson, invite each child to close their eyes and take a drink of water slowly and mindfully, visualising it travelling around their body, just like water travels through a tree.

TEACHER TIP:
There is an opportunity to link this learning to the **principle of the Cycle** by explaining that trees also release water as water vapour through their leaves. This helps to create the right conditions for other living things to thrive. A good example of this is seen in rainforests, which the children will learn more about in the spring term as part of the enquiry *Why should we protect the biodiversity of the rainforest?*.

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Enquiry question:
How can we identify native trees in autumn?

Harmony principle:
The principle of the Cycle

Resource 3A

How do you know that celery is a stem?

See which other parts of plants you can identify in the photo.



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Resource 3B

water

predict

trunk or stem

observe

nutrients

xylem
(tiny tubes)

transport

leaves

celery

plant or tree

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Lesson

04

Enquiry question:
How can we identify native trees in autumn?

Harmony principle:
The principle of the Cycle

NC Links

Plants
Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers

Working scientifically:
Recording findings using simple scientific language, drawings, labelled diagrams.

Scientific enquiry type:
Research using secondary sources

Key vocabulary

Vocabulary relating to plants, working scientifically and thinking sustainably is highlighted within the unit introduction.

Why are a tree's leaves so important?

What do we already know?

Begin the lesson by recapping the children's prior **learning about Nature** by asking them: *Do trees stay green all year round? What happens to them through the seasons?*

Using images, recap prior learning from Year 1 National Curriculum content and ask the children to describe the difference between deciduous and evergreen trees.

Ask the children to recap: *When leaves fall from a tree, where do they go? Why are seasonal changes important?*

What are we learning today?

Move the children's **learning about Nature** on by asking them: *What happens to different trees in autumn?*

Draw the children's attention to how some trees may look different in different seasons and discuss why this is. Tell them that they will be going on a Nature walk and that they will be trying to identify trees using leaves still on the branches and those that have already fallen to the ground.

See if the children can name any trees that they know grow in the local area, then look at the leaves on the Woodland Trust *Nature Detectives Leaf ID* resource and discuss their distinguishing features.

TEACHER TIP:
There is an opportunity to explore the geometry of the leaves of trees native to the UK using our geometry pack linked to this enquiry.

You will need

Copies of the *Nature Detectives Leaf ID* resource from the Woodland Trust website

Magnifiers

To plan a walk through a local natural space with trees and complete a risk assessment

How are we learning today?

A Nature walk allows children to **learn in Nature** in this lesson. Guide the children on a walk through the school grounds, a local woodland, a local park or another natural space – even better if the ground is covered in leaves that the children can pick up and observe closely!

In pairs, the children use leaves to identify as many species of tree as they can. At different points during the walk, invite the children to choose a leaf and observe it using a magnifier, playing close attention to the veins and to its texture, for example. They could discuss something that interests them about the leaf with their partner.

At the end of the walk, ask: *How many different native trees did you identify?*

TIME TO EXPLAIN:
In pairs, the children create their own identification chart using natural materials that they've collected on their walk.

Briefly return to **learning about Nature** by asking the children: *What do leaves do for trees?*

It may be helpful at this point to return to the classroom to watch the BBC Bitesize clip *What is the role of leaves?*.

Extend the children's thinking by asking them: *How are leaves part of the life cycle of other living things? (e.g. as a source of food) How do leaves help the planet? (e.g. by absorbing carbon dioxide and producing oxygen)*

Adapt the learning

Children requiring additional support can be guided to focus on two or three local native trees.

Challenge children to explore: *How are leaves part of the life cycle of other living things?* (e.g. as a source of food) *How do leaves help the planet?* (e.g. by absorbing carbon dioxide and producing oxygen)

Link the learning

CLIMATE ACTION PLAN:
Biodiversity; Decarbonisation

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What have we learned today?

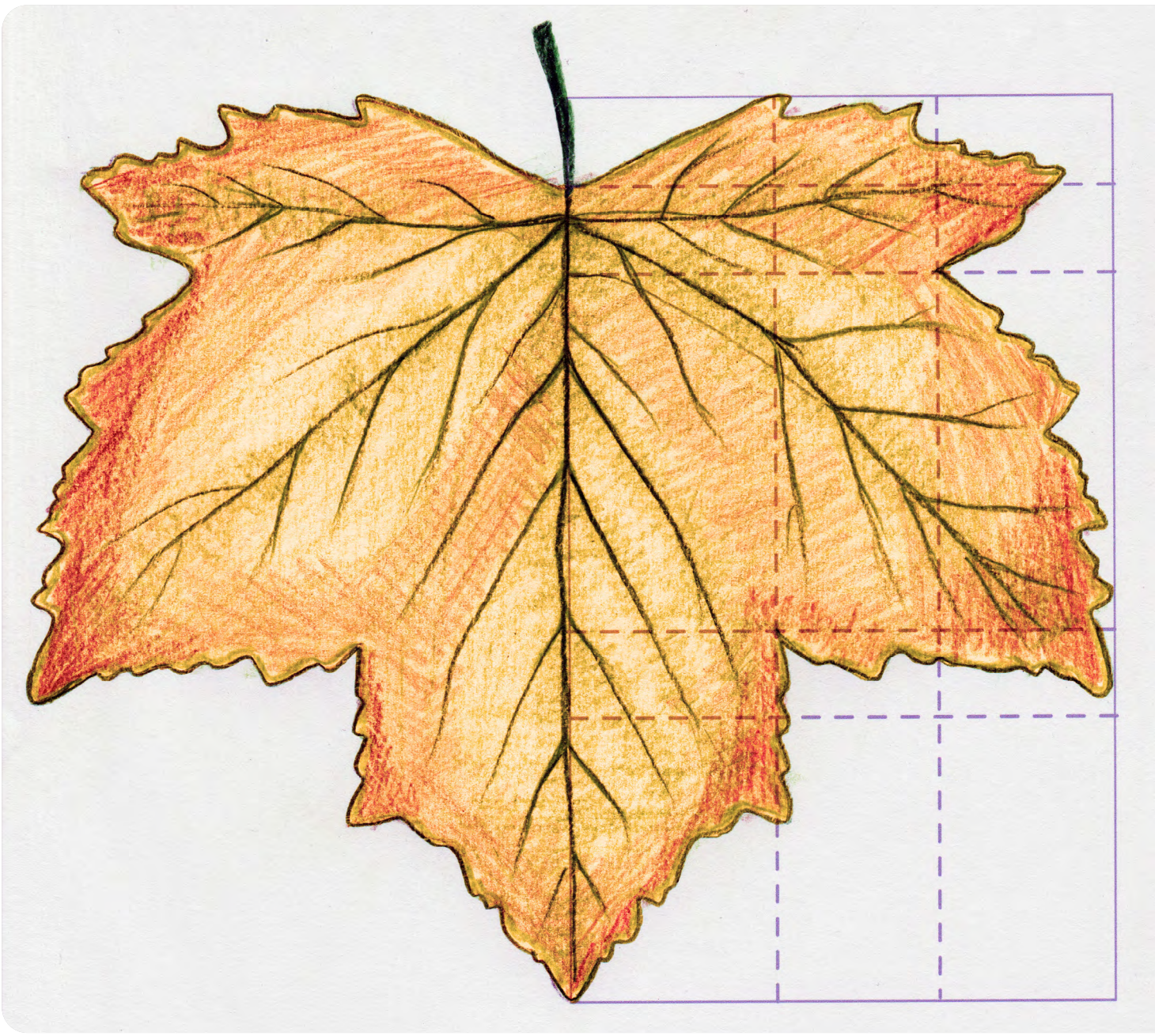
Encourage the children to reflect on their **learning about Nature**, and assess their understanding, by asking: *What do leaves do for trees? What do leaves do for other living things? What happens to a deciduous tree at each stage of the seasonal cycle?*

Draw out the **learning from Nature** by reminding the children of their learning about the **principle of the Cycle** in Lesson 2: that a tree's fallen leaves break down and enrich the soil. They are part of the important cycle of growth and decay in Nature.

Move on to discuss how a tree's leaves are also part of another important cycle: they absorb carbon dioxide from the air at certain times and emit oxygen, which is essential to the survival of many other living things.

As a class, discuss what we can do to improve the health of our planet, just like trees do. For example, we can plant trees or even grow them from seed.

TEACHER TIP:
A further activity to develop the children's understanding of cycles in Nature with reference to this learning would be to invite them to sit quietly and focus on their breathing. Encourage them to reflect on what happens when we breathe. Make the connection that we are breathing in oxygen that trees 'breathe out' and that when we breathe out, we breathe out carbon dioxide, which trees then 'breathe in'.



Explore with children the geometry of the leaves of trees native to the UK using our geometry teaching pack.

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Lesson **05**

Enquiry question:
How can we identify native trees in autumn?

Harmony principle:
The principle of the Cycle

Where do fruits and seeds come from?

NC Links

Plants
Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Working scientifically: Identify differences, similarities or changes related to simple scientific ideas and processes

Scientific enquiry type:
Identifying, grouping and classifying

Key vocabulary

Vocabulary relating to plants, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

To arrange a visit to a local wood or wooded area where children can collect native tree seeds. If you are unable to gather enough native tree seeds, there are various places that you can order seeds from, including The Woodland Trust, RP Seeds and Tree Seed Online.

Copies of the *Nature Detectives Fruits and Seeds ID* resource from the Woodland Trust website (one per pair or group of children)

Copies of the *Nature Detectives Leaf ID* resource from the Woodland Trust website

Copies of Resource 5B for any children requiring additional support (keep them to reuse in Lesson 6)

Adapt the learning

Children requiring additional support could use the word bank on Resource 5B.

Challenge children to sort seeds into dispersal groups (wind, animal, falling from tree).

Link the learning

CLIMATE ACTION PLAN:
Biodiversity

What do we already know?

Begin the lesson by recapping the children's prior **learning about Nature**.

Share with them the image of a bee on apple blossom on Resource 5A and ask them: *What can you tell me about this photograph? How is the bee connected to our learning about flowering plants and trees?*

Draw out in discussion what pollinators are, why they are important and what job the flower does for the plant.

Ask the children: *Do all trees have flowers? Why is blossom important?* It may be useful at this point to link to the children's prior learning about bees in Year 2 and the lifecycle of wildflowers in Year 1.

What are we learning today?

Move the children's **learning about Nature** on by providing them with a variety of tree fruits and tree seeds (or images) that will be familiar to them, such as apples, conkers, acorns and sycamore seeds. Ask them to identify as many different fruits and seeds as they can, taking feedback and recording the names in a class word list.

Ask the children to work in pairs to explain where they think these fruits and seeds have come from and how they were formed. Take feedback and discuss the link between flowers and pollination, and the formation of fruits and seeds.

Ask the children: *Which of these are fruits and which are seeds? How do you know? What are the similarities and differences between these seeds?*

Discuss how the features of some seeds allow them to be spread effectively.

How are we learning today?

A seed hunt outdoors, with the children working in pairs or small groups, allows them to **learn in Nature** in this lesson. Before the seed hunt, ask the children: *What is happening to the trees at this time of year?*

The children identify the seeds and fruits they found using the Woodland Trust's *Nature Detectives Fruits and Seeds ID* resource. Challenge them to match five seeds or fruits with the name of the tree they grow on, using the Woodland Trust's *Nature Detectives Leaf ID* resource for support.

TIME TO EXPLAIN:
The children create their own information sheet with drawings of the fruits and seeds they found, and add information about the name, shape, how many they found and the name of the tree they grow on.

STEM SENTENCES:
I have identified this seed as _____ because it has _____. This seed comes from a _____tree. I predict the seed will be dispersed by _____(e.g. wind, animal, falling from a tree) because _____.

The children dry the seeds they collected ready to be stored in containers then planted at an appropriate time.

What have we learned today?

Encourage the children to reflect on their **learning about Nature**, and assess their understanding, by asking: *How are seeds formed? How do flowers become fruits?*

Draw out the **learning from Nature** linked to the **principle of the Cycle** by discussing with the children how the design of seeds and fruits contributes to the survival and continuation of the life cycles of many different species of tree. For example, sycamore seeds are lightweight and have 'wings' so they are more easily dispersed by the wind; conkers are heavy so they fall to the ground.

Reflect on why it is important that there are many different types of tree growing on one area e.g. to provide a diversity of food, habitat and shelter for many different living things. When any system (such as a woodland) is diverse, it is more resilient.

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Lesson

05

Enquiry question:
How can we identify native trees in autumn?

Harmony principle:
The principle of the Cycle

Resource 5A



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Resource 5B

seeds (pips)	pollination
speed dispersal	apple tree
seedling or sapling	germinate
pollinator	falling from a tree
blossom	wind
fruit	animal

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Lesson

06

Enquiry question:
How can we identify native trees in autumn?

Harmony principle:
The principle of the Cycle

NC Links

Plants
Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers

Working scientifically: Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Scientific enquiry type:
Pattern seeking

Key vocabulary

Vocabulary relating to plants, working scientifically and thinking sustainably is highlighted within the unit introduction.

You will need

A variety of native apples (if possible, heritage varieties from your local area) to gather seeds from

Knives suitable for children to use and chopping boards

Magnifiers

The Tree Council works with schools to support them in starting their own orchard. Refer to their *School Orchards* booklet for useful information.

Adapt the learning

Children requiring additional support could cut out the labels on Resource 5B and add them to their own illustration.

Challenge children to add their own description of each part of the tree to their diagrams.

Link the learning

CLIMATE ACTION PLAN:
Biodiversity; Decarbonisation

What can we learn from an apple tree?

What do we already know?

Begin the lesson by recapping the children's prior **learning about Nature** by asking them: *What are the similarities between trees and other flowering plants? What are the differences?*

What are we learning today?

Move the children's **learning about Nature** on by sharing apples with them – ideally, native, heritage varieties.

Working carefully in pairs, ask the children to slice their apple in half across the middle so they can see the cross-section. Ask them: *What can you see? How did the seeds get there? What are the stages in the life cycle of an apple tree?*

Invite the children to remove the seeds from the core of the apple, if they can, and to observe these with their partner using a magnifier.

Provide the children with images of the different stages in the life cycle of an apple tree for them to order. As an extra challenge, you could hide one stage and ask children to identify which stage is missing.

Discuss with the children how the fruits and seeds they have just been examining contribute to the life cycle of an apple tree. Go on to draw out the children's learning from the enquiry so far about the functions of each part of the tree and how they help each stage of the life cycle.

STEM SENTENCES:
An apple is formed when apple blossom is _____. (pollinated)
Seeds are found _____ (inside) the apple.
Seeds are important because _____ .
(e.g. they grow into new trees/they support the tree's life cycle).

To consolidate the children's learning, ask: *Why does an apple tree produce so many apples containing so many seeds?* Discuss the fact that trees and other flowering plants produce an abundance of seeds to ensure the survival of the species. They are self-sustaining and this is a good model of sustainability.

TEACHER TIP:
There is a great opportunity for the children to taste some of the apples they have been working with in this lesson. If you have been able to source different varieties, they could compare their taste and texture.

How are we learning today?

TIME TO EXPLAIN:
The children create their own illustration using images and words (see Resource 5B) to describe the different stages in the life cycle of an apple tree, starting with the seeds in the apple that they have just been observing.

Ask the children: *How does the blossom help continue the life cycle of an apple tree? How is the seed formed? How do the seeds continue the cycle of the apple tree? Why are the seeds of an apple tree contained in an apple?*

The children could dry the apple seeds and store them along with the seeds they collected in Lesson 5, ready to be planted at an appropriate time.

TEACHER TIP:
If there is an orchard near to the school, arranging for the children to visit it to see apples growing on trees for themselves – and to taste some varieties that aren't available in the supermarket – would enrich the learning.

Alternatively, you could invite someone involved in the orchard to speak to the class. They might also be able to advise where in the school grounds you might be able to grow an apple tree, or a small orchard, if space allows.

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What have we learned from this enquiry?

This part of the lesson provides an extended opportunity to reflect with the children on their **learning from Nature** from the whole science unit and to **learn in Nature**.

As a class, take time to sit or lie under a tree and to focus on any sounds the children can hear that are associated with the tree.

Encourage the children to imagine what is happening below the ground. Ask them: *What is going on below our feet? What is happening above ground in the tree right now? What are the trees doing?*

Encourage the children to make comparisons between the trees and themselves e.g. 'breathing', moving, eating, growing.

As a class, recap the children's learning about why trees produce seeds and reflect on the fact that all living things need to reproduce to sustain the species.

Take time to observe trees that are at different stages in their life cycle. Ask the children: *How do you think the smaller trees are able to survive? How do trees work together? Can trees communicate?*

Explore the fact that, just like a community of people, trees can work together and support one another so that each tree thrives.



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