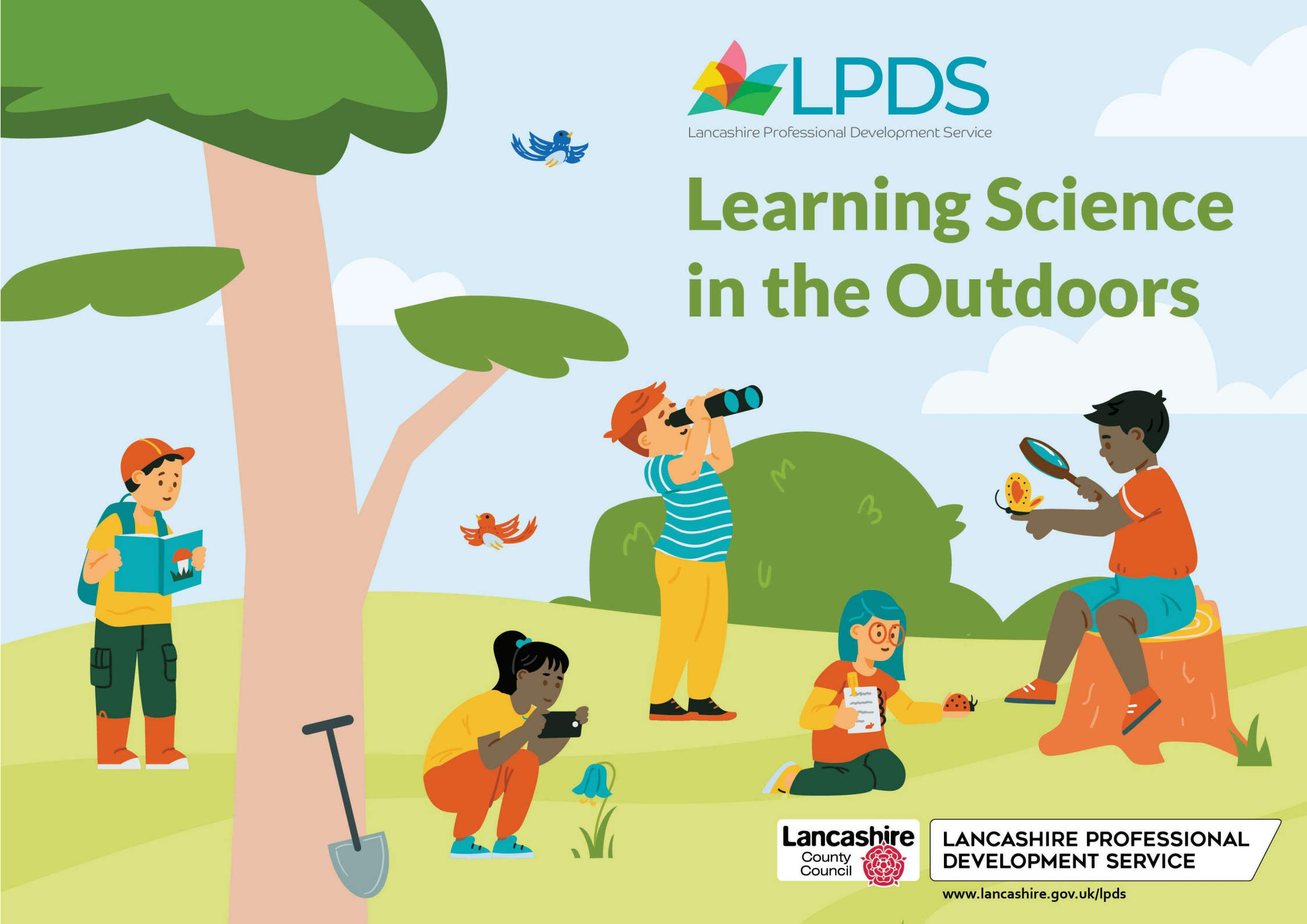
LPDS

Lancashire Professional Development Service

Learning Science in the Outdoors



Lancashire County Council

LANCASHIRE PROFESSIONAL DEVELOPMENT SERVICE

www.lancashire.gov.uk/lpds

Learning Science in the Outdoors
Contents

Click on the section title to go directly to that page

Learning Science in the Outdoors

Introduction

This new resource provides support for embedding '*learning about the outdoors*' and '*learning in the outdoors*' into your primary science curriculum.

It will support teachers and science subject leaders to react positively to the DfE's policy paper, Sustainability and climate change: a strategy for the education and children's services systems - GOV.UK (www.gov.uk) Apr22 (updated Dec23), which sets out new statutory requirements that by 2025:

> '*All education settings will have nominated a sustainability lead and, with support, put in place a climate action plan.*'

Children love learning outdoors and research shows this is often a more successful way of learning. Many schools already consider links with the nature around them, promote positive sustainable actions and embed learning around climate change. However, at times, these opportunities are ad hoc, are dependent on teacher expertise and interest and are not always embedded into long term curriculum mapping. This resource aims to help embed opportunities in a way to ensure learning and experiences are built upon progressively and link directly with National Curriculum objectives and progression.

With ideas for every topic, in every year group, this resource aims to provide a range of suggestions for getting outside, being more active, appreciating and caring for nature and understanding biodiversity. It also provides links to key resources to support teachers' planning on sustainability and climate action. This publication is sure to be a time-saver for many science subject leaders wanting to enrich their science curriculum.

All ideas are presented as questions to investigate and are referenced by topic and type of enquiry, covering:

- Observing change over time
- Identifying, classifying & grouping
- Comparative & fair testing
- Pattern Seeking
- Researching.

It contains ideas for growing plants in each year group along with a rationale of how a particular plant might link to the year group objectives plus ideas for plotting learning throughout the year for specific year groups (Y1-Y5, NA for Y6). In addition, there is a plan for linking learning to key sustainable actions for each year too, such as recycling, composting and healthy soil, reducing the impact of extreme weather, reducing greenhouse gases and air pollution, using renewable energy sources and much more. Careful consideration has been made as to which year group to locate this in, to ensure National Curriculum learning links to relevant real-world issues.

Developing a curriculum to incorporate learning about nature, biodiversity and more sustainable living to support our planet, is crucial. It is one area where we can truly make a difference now and in the future for all children.

It is anticipated that teachers will use the resource to select ideas from in the first instance and then build upon these opportunities over time. The resource has been written as a curriculum and assessment review is being undertaken in England (Autumn 2024). It is anticipated that Sustainability and Climate Action will form a part of the changes for a revised curriculum. Some of the ideas in this publication have been suggested in anticipation of what might be to come although this is still to be confirmed at the time of going to print.

Should you require further support about sustainability and climate action, developing a love of nature or how to improve biodiversity within your school setting then please get in touch with Rachael Webb, Teaching and Learning Consultant for Primary Science, Lancashire Professional Development Service, rachael.webb@lancashire.gov.uk .

We would like to thank the organisations included in this resource who have allowed us to link to key resources to support teachers with their planning.

We would also like to extend our appreciation to the Lancashire schools who have shared their own experiences, trialled out some ideas and shared photographs and images of pupil experiences and outcomes. We hope these go on to inspire further generations to make a difference.

With special thanks to:

Nicola Saporita-Clark, All Saints' CE Primary School, Clayton-le-Moors, Lancashire

Fiona Lowe, The *Cathedral* Catholic *Primary School,* Lancaster, Lancashire

Corinne Mason, St Thomas' CE Primary School, Lytham, Lancashire

	AUT1	AUT2	SPR1	SPR2	SUM1	SUM2
PLANTS	What evidence of life cycle stages can we collect throughout the year (particular focus on seeds and flowers for pollination) Seasons do not always match to what we traditionally call each half term. AUT: Sept/Oct/Nov WIN: Dec/Jan/Feb SPR: Mar/Apr/May SUM: Jun/Jul/Aug					
		SIGNS OF LIFE CYCLE STAGES • **What seeds can we find in our school grounds / walk to school / local greenspace?** e.g., sycamore (helicopter spinners), oak (acorns), horse-chestnut (conkers) • **Who can we get involved in seed gathering season?** Take part in The Tree Council 'Seed gathering season' activities. • **How many ways can you find to group the plant parts found in the school grounds?**		**CONDITIONS FOR GROWTH** **Do …** (*add type of plant here*) **all grow the same if planted in different conditions / areas of the school grounds?** • Compare growing seeds and seedlings in a polytunnel, in classroom and outdoors to observe the effect **SIGNS OF LIFE CYCLE STAGES** **Can you name all the parts of the plants found in the school grounds?** ⟷ **SEED DISPERSAL AND SEED GROWTH (APR/MAY)** • **Will a dandelion seed grow?**	**Opportunities from Main PLANTS unit**	**SIGNS OF LIFE CYCLE STAGES** • **How many ways can you find to group the plant parts found in the school grounds?** • **What are the flowers, leaves, seeds, berries like for this plant?** How does this differ from what was found in Autumn or Winter?

Opportunities for growing plants across the curriculum - Y3

Encourage the growing of plants from seeds or seedlings but when doing the 'conditions for growth' fair test in Y3, do this with seedlings/young plants NOT seeds as this would lead to a different experiment linked to conditions for germination rather than growth. (Seeds generally need moisture and warmth to begin growing, whereas seedlings/young plants require water, light, the correct temperature and space and nutrient rich soil to continue to grow healthily). It is useful to observe different types of plants growing to expand children's experiences. Quick growing examples means children can see a full life cycle within a relatively short space of time and can see the effects of different conditions on plants more easily. Choose 1 or 2 opportunities from the list below:

- **Herb plants** –e.g. Basil(or miny but this herb is grown in Y1) for growth investigations such as 'How do changing/covering/removing leaves affect plant growth? Growing your own and using young plants for this investigation works well. Ready grown versions are cheap to purchase from supermarkets if you want a comparison or multiple varieties to test.
- **Rapid-cycling brassicas –** (such as Brassica Rapa or Brassica Napus) produce flowers in 2-3 weeks and ripe seeds within 5 weeks. This video, although American, provides a good overview for teachers YouTube 50 classrooms are growing Brassica Rapa Plants.
- **Mung beans** or **peas (sugar snap)** are good examples for considering conditions for growth using fast growing seedlings. These varieties grow quickly both indoors and outdoors and can be used to consider the effect of different conditions on a crop. Grow plants indoors first and then plant outdoors once they are more established. When growing peas from seed outdoors too and compare. Give them a 'tent' of twigs for their stems to grow over for support. Long shoots provide excellent opportunities to develop measuring accuracy.
- **Garlic** typically takes 8-9 months to grow and is usually planted in late autumn (Oct to Nov) which is similar to when the Y2 children will be planning other bulbs and so provides an opportunity to link to prior learning. Garlic benefits from overwintering. Planting garlic in the late autumn allows the cloves to experience a period of cold which helps the bulbs to development properly. Children could compare growing garlic indoors in the warmth (over the winter months) and outdoors in the cold. It generally grows better outdoors. This can be used to investigate how temperature can affect growth. Over the winter, the garlic remains dormant but will start to grow in early spring. This is a good opportunity to revisit seasons work from Y1 and emphasise the word 'dormant' or 'resting' rather than the children thinking that a tree/the garlic 'dies' over winter which is a common misconception. Garlic is normally harvested in mid-summer when the leaves start to turn yellow.
- **Grow a dandelion from a seed** head collected in the school grounds. Do all the seeds germinate? (Common misconception: Some children believe the dandelion 'clock' seeds are just for show and don't always realise these are all potential new plants. Common misconception: Some children think that dandelions with seedheads are different plants than dandelions with yellow flowers and often do not realise they are the same plants at different stages of their life cycle). Growing dandelions from seeds collected from seed 'clocks' is a useful way to explore a full plant life cycle in the real world and are easy to find growing in the wild. Prime month for observing dandelion seed 'clocks' is mid Apr to early May.
- **Pumpkin seeds** can be a useful alternative to more familiar seeds such as sunflowers when studying plant life cycles and links to the Practical Action 'Pumpkins Against Poverty' in the PLANTS unit below. They germinate within 5-8 days normally during April/May, grow quickly and produce large flowers within ten to fourteen weeks. They can be harvested in the following October with a new Y3 class or with EY. The seeds from pumpkins grown can then be dried and replanted in the spring to continue the life cycle or roasted and eaten. Y3 children could ask EY to collect the seeds from pumpkins grown. In Y3, children could investigate:
  - What is the effect of crowding seeds together in soil / spacing them well apart, on the growth of the pumpkin plants?
  - Which is the best measure of successful plant growth? Length of roots? Height of shoot? Number of leaves? Weight of crop? This presents a great opportunity for recording multiple results within a table.

- Home learning task: Grow plants in containers linked to their end product e.g., tomato seeds in tomato can, potatoes in a crisp tube, chives in a sour cream and chive dip container, beans in a bean tin, peas in a garden pea or mushy pea tin, etc.

Gardening skills: idea from RHS School Gardening on spacing seeds when planting Measuring sticks / RHS Campaign for School Gardening and thinning them as they grow Weeding and Thinning Flower Seedlings / RHS Campaign for School Gardening This links with 'conditions for plant growth' in Y3.

Opportunities for Learning about Sustainability and Climate Action in Y3

Improving our school grounds for pollinators

- Observe the growth of wildflower/meadow seeds planted by Y4 in APR/early spring to improve school grounds and encourage pollinators to visit. Y3 use these to tally how many bees visit a patch of the meadow in a set time. Compare this with another area of the school grounds.
- Consider taking part in the National Education Nature Park's pollinator count Pollinator Count | Education Nature Park
- 'Point of View' of a bee from Points of view | Education Nature Park

Improving our school grounds with more flowering trees

- You can claim your free Trees For Schools from here Free Trees for Schools and Communities - Woodland Trust along with their wealth of resources linked to trees and the school grounds

Consider adapting these support materials linked to sustainability and climate action for the different Y3 topics below:

- PLANTS: Nutrients and Fertilisers for Plants Unit: What plants do and what they need | KS2 Science | Oak National Academy (thenational.academy)

- PLANTS: 'Pumpkins Against Poverty' materials from Practical Action Plant Investigations | Education Nature Park (practicalaction.org) explores the difference that growing pumpkins can make to the lives of people living in flood affected regions in Bangladesh. In the pupils' own investigation, they work as a team and design experiments to work out what is needed to make pumpkin seeds germinate into healthy seedlings. For a simpler version see the 'Sandy Seeds' resources here Primary upd8s - Practical Action but try using a variety of different composts, soils and fertilisers to compare with growing seeds in sand.

- ROCKS AND SOILS: Considering how soil can be 'healthy soil'. This lesson Lesson: Healthy soil (non-statutory Climate Change & Sustainability) | KS2 Science | Oak National Academy (thenational.academy) can be found in the 'Rocks and Soils' unit so can provide a great link to soil/fertilisers within another topic). It considers the effect of too much rain (from flooding) or not enough rain (linked to climate change) on how well crops grow.

- ROCKS AND SOILS: Water permeability and weather
  What happens to your school ground in heavy rain? Does all the water pool in one place? What materials do you have in your school grounds that will help rainwater soak in? Water permeability | Education Nature Park This considers how schools can play their part in reducing the effect of increased/excessive flooding on their school grounds.

- HEALTHY EATING: Locally produced foods Lesson: Local food (non-statutory Climate Change & Sustainability) | KS2 Science | Oak National Academy (thenational.academy) - This lesson provides another link to learning about plants. Consider air miles for food that travels from further afield than our local area/UK by researching the origin indicated on their packaging (particularly from research fresh food packaging such as fruits, salad and vegetables).

Year Group	3	Unit	PLANTS

Curriculum Objectives

- 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.
- Investigate the way in which water is transported within plants.
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Potential Opportunities for Outdoor Learning – be selective rather than aiming to do everything.

Comparative & fair testing	**Do …** (*add type of plant here linked to plant opportunities above*) **all grow the same if planted in different areas of the school grounds? –** Consider comparing the same plants growing in the classroom with growing in a greenhouse/polytunnel with growing in the outdoors (SPRING) **Do …** (*add type of plant here linked to plant opportunities above*) **all grow the same if planted in differing types of compost?** Aswell as controlled experiments in the classroom, compare with different growing medium in real outdoor planters/growing beds too. Consider this opportunity Plant Investigations | Education Nature Park from Learning Through Landscapes. It provides support for a real-world mathematical application and scientific experiment investigating the impact of soil pH or different fertilisers on plant growth. **What conditions do pumpkins need to germinate?** Use the 'Pumpkins Against Poverty' materials from Practical Action Plant Investigations | Education Nature Park (practicalaction.org) to explore the difference that growing pumpkins can make to the lives of people living in flood affected regions in Bangladesh. In the pupils' own investigation, they work as a team and design experiments to work out what is needed to make pumpkin seeds germinate into healthy seedlings. This resource links to the Sustainable Development Goal 2 'Zero hunger'. (Top tip: use the word 'variable' rather than 'factor' as indicated on the pupil resource). For a simpler version see the 'Sandy Seeds' resources here Primary upd8s - Practical Action but try using a variety of different composts, soils and fertilisers to compare with growing seeds in sand to extend this to match Y3 expectations. **How do different conditions affect the growth of spring onions?** Explore the Terrific Science 'Grow Investigation' resource from Grow: Lesson resources - BBC Teach to set up an investigation into conditions for plant growth using ready grown spring onions. This investigation provides a great opportunity to look at the skill of measuring accurately. The children must measure water volume, plant length, root length and temperature on a daily basis. (NB -if preferred, this investigation can be moved to Y5 where the maths skills for finding averages and drawing line graphs would be more appropriate. Discuss as a school, which year to include this in your curriculum mapping to avoid repetition).
Identifying, classifying & grouping	**What seeds can we find in our school grounds / walk to school / local greenspace?** Tree seeds are ideal for an Autumn/September focus e.g., sycamore (helicopter spinners), oak (acorns), horse-chestnut (conkers). Seed Gathering Season - The Tree Council (Annually in Autumn on 23rd September)

	Ideally collect seeds during school time during a trip to a local greenspace during an 'outdoor' lesson. If this cannot be facilitated, plan a homework competition to collect seeds during x2 weekends in late September/early October. Be prepared to collect samples yourself in case you need more. Other staff/family members will often help too if given plenty of notice. Another group could repeat something similar but looking at berries rather than seeds. Remind the children not to eat berries they have collected. **How many ways can you find to group the plant parts found in the school grounds?** Collect as many plant parts (root, stem, leaf, bud/flower, seed, fruit/berry) as possible in a set period of time and then sort them in different ways, photographing evidence of group titles/criteria each time (AUTUMN, repeat in SUMMER & compare). If you wanted to avoid collecting real samples from growing plants, children could take photographs of different plant parts and use these for their sorting. **What makes a plant a plant? Can you name all the parts of the plants found in the school grounds?** Take photographs of 3 different plants around the school grounds/park/local area and label their features and their functions. E.g., of different plants - weeds, trees, bedding plants, hedgerows, bulbs, wildflowers, etc. Revisit this question at different times of the year and in different locations to discuss the biodiversity of plants and consider their life cycles (linked to plant parts). To record, children can either a) collect the specimen and label/describe around it on an A3 sheet of paper which can then be photographed for later reference or b) photograph the growing specimen and label around the image. (See SEPS KS2 samples of work, p17 Stoke exemplification for primary science (SEPS) pupil work collections (bathspa.ac.uk)). By using real specimens, the children learn about the variety of structures and the commonality of their functions rather than just an image in a one-off lesson). Each group could aim to label x2 or x3 specimens. For plants that are not currently in flower or showing seeds e.g., blossoming trees, the children could research other parts of the plant during different parts of its life cycle. Take books and secondary sources (such as classification charts/cards) outside to do this. **How many plants can you name that are found in the school grounds? Are all plants the same? –** Skill: Using spotter sheets /classification charts. This opportunity also appears in the Y4 opportunities so decide as a school whether to do this in the Y4 Habitat unit or in Y3 Plants unit or in both but focused in different areas. Doing it in both year groups allows for further practice and use of more detailed classification charts (prior to children designing their own in Y4).
Observing over time	**How far do dandelion seeds spread?** (SPRING esp. in May). See also 'Drifting Dandelions' from CREST SUPERSTAR resource All SuperStar challenges (crestawards.org) (use the tool bar to scroll to pg 72-75) **Are dandelion clocks 'real seeds'? Will a dandelion seed grow? Are dandelion leaves arrowheads from day one of growth?** Use magnifiers to draw a dandelion seed in detail (link to seed dispersal). Collect a seed head (small cardboard crisp tubes work well for collecting in) then try and germinate in small seed trays. Observe over several days / weeks to see what happens to the leaf shape. (SPRING – late APR/ early May). This Observing Changes Over Time investigation also allows children to see first-hand that a dandelion flower and a seedhead are the same plant, just at different stages of its life cycle. Also consider the tips here too Yellow weeds - Explorify . **How much water do plants need?** Use the TAPS (Teacher Assessment in Primary Science) Investigation Measuring plants to help children explore the requirement of plants for life and growth. Encourage discussion on how to set up the investigation and focus the individual recording on developing the skills of making systematic and careful observations and measurements using standard units.

	What happens to a plant when left with no water/light/air? What happens to a plant when you alter/remove/cover the leaves? - Outdoor or greenhouse/polytunnel opportunity (SUMMER). This works well with herb plants such as basil which have lots of leaves and are quick growing. What if all the leaves were removed? What if leaves from one side were removed? What if leaves from the top or leaves from the bottom were removed? What if the leaves (or half of the leaves) were covered so no sunlight could get to them? Children can compare the affects with a control plant which has had all its leaves left on. Mini herb plants from the supermarket can be used for this rather than destroying children's own plants. Each group could have three mini plants. One is left to grow under normal conditions and the other two have their leaves changed/removed in some way. Children can watch the plants grow. What happens to them over time? This helps the children to understand that leaves are essential for plant growth (to make its own food from the sunlight and water). When learning about what plants need to grow, it is worth revisiting seed germination introduced in y2. Seeds generally need water and warmth to begin germinating but water, light and soil to continue to grow healthy. A suitable outdoor game to play to reinforce this would be Bloom or doom: The seedling game | Education Nature Park **Is a blade of grass a stem or a leaf?** What do the children think? How many different ideas can the children generate within their group? How can they find out? - Observe grass growing over time. The children would need to be able to mark off a section of grass in the school grounds that would not be mown and then observe growth over the course of several weeks. Do their observations change their initial ideas? Alternatively, the children could plant their own plot of grass in a planter outside the classroom and observe it growing over time. Photographs with annotations and measurements can also be added to their nature journals.
Pattern Seeking	**What colour flowers do pollinating insects prefer? How many butterflies/bees visit our meadow plants in a 10-15min period? Are yellow flowers visited more or less often by insects than blue flowers (for example)? Do pollinators prefer some plants to others? Are some days better than others?** (SPRING into SUMMER). Y4 plant wildflower seeds in APR, Y3 can observe growth (taking photos as they develop) and then use to observe, tally and record pollination visits across a short period of time (e.g. 10mins) over several days (in SUMMER). This Education Nature Park resource can be used to take part in a real data collection of pollinator numbers Pollinator Count | Education Nature Park **Do butterflies prefer flower nectar, or a homemade nectar? How many butterflies visit the homemade nectar compared with the wildflower meadow in a 10-15min period?** Make butterfly feeders using the Tree Tools for Schools and compare with real flowers. Butterfly feeder for kids - Nature Detectives (treetoolsforschools.org.uk) . **Do plants prefer to grow under a tree near the trunk base or further away from a tree?** Good for a woodland walk activity with more mature trees. Most plants will not grow directly below a larger tree trunk as there will be less light falling on the leaves and so less light to use for making the plants own food (photosynthesis).
Researching	**What are the flowers, leaves, seeds, berries like for this plant?** – collect samples of a plant lifecycle at different times of the year and use secondary sources whilst in the outdoors to find/identify other parts of the lifecycle (not currently visible).

	Can you research and find out information about a tree/plant found in the school grounds? Use photographs and real 'pressed' examples to make your own herbarium about this plant. Make your own herbarium specimens / RHS Campaign for School Gardening **Can you research and find out about an unusual plant?** – This activity is *about the outdoors* rather than *in the outdoors* and can be used to encourage children's curiosity about plants.
Problem Solving Create / Invent / Design	**Can you design your own plant?** What features does it have? Can you explain why each feature is important? Using learning from the unit and ideas from Design a plant | Education Nature Park encourage the children to design their own plant with features to support plant growth, nature and people. Annotating features and saying why they are important could be used of an assessment of learning at the end of the unit.

Year Group	3	Unit	ANIMALS, INCLUDING HUMANS

Curriculum Objectives

- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.
- Identify that humans and some other animals have skeletons and muscles for support, protection, and movement.

Potential Opportunities for Outdoor Learning – be selective rather than aiming to do everything.

Identifying, classifying & grouping	**What food group does x belong to? -** potential to do in outdoor space to support active movement during the day. Children use a larger outdoor space to collect images of different foods hidden outside. Using group discussion, can the children decide how to group the different examples into food groups learned in a previous lesson (based on the Eatwell Plate)? **Does it have a skeleton or not? -** potential to do in outdoor space to support active movement during the day. Children use a larger outdoor space to collect images of animals (vertebrates and invertebrates) hidden outside. Using group discussion, can the children decide how to sort the different animals into groups?
Pattern Seeking	Choose one of the following questions to test in the outdoor space. Or have a choice of 2 for the children to select one from. Choice within an investigation allows for some ownership and independence when planning an investigation. This idea also provides a potential link to physical activity and 60-active minutes. Skill focus: measuring accurately and recording data in a table. Can they design their table independently? Only provide scaffolds (if required) once they have had time to think and have a go. **Do people with long arms throw further?** **Can people with short legs jump higher?** (measure 'jumps' against a wall – children can use a sticky note or chalk to mark how high they jump.) **Can people with longer legs run faster?** **Can people with bigger hands catch a ball more easily?** **Do boys have longer legs than girls of the same height?** **Are adult heads bigger than children's heads?** **Do taller children have longer arms/bigger feet/longer legs, etc. than shorter children?** **Am I/Are you a square?** (Look at arm span versus height) With some of the above opportunities, repeat readings could be introduced by allowing the children x3 attempts and then choosing 'the best' (doing 3 and taking averages would not be an appropriate maths skill for this age phase). See also TAPS (Teacher Assessment in Primary Science) 'Investigating Skeletons' for a skill focus and lesson plan outline for this lesson.

Researching	HEALTHY EATING: Locally produced foods Lesson: Local food (non-statutory Climate Change & Sustainability) | KS2 Science | Oak National Academy (thenational.academy) - This lesson provides another link to learning about plants but linked to more sustainable ways of living. Consider air miles for food that travels from further afield than our local area/uk by researching the origin indicated on their packaging (particularly fresh food packaging such as fruits and vegetables). Children could use what they have learned to promote 'reducing food miles' to parents.
Review Learning and Key vocabulary in the Outdoors	**What are the main bones of a human skeleton? What does the skeleton of a vertebrate look like?** During an outdoor lesson use fallen leaves, twigs, seeds, and bits of bark to make a model of a human skeleton. Label the main bones and their features (Skull, backbone/spine, ribs, bones for movement) using what you have learned during the unit. Can they aim to get the number of bones represented with some accuracy rather than just, for example; a long stick used as the backbone; it should be made up of lots of little bones. Do children represent the joints correctly, for example in the fingers. Now make a skeleton for a mammal, bird, fish, or amphibian. Can another group guess what animal group their skeleton belongs to by the bones and how they have been represented?

Year Group	3	Unit	ROCKS & SOILS

Curriculum Objectives

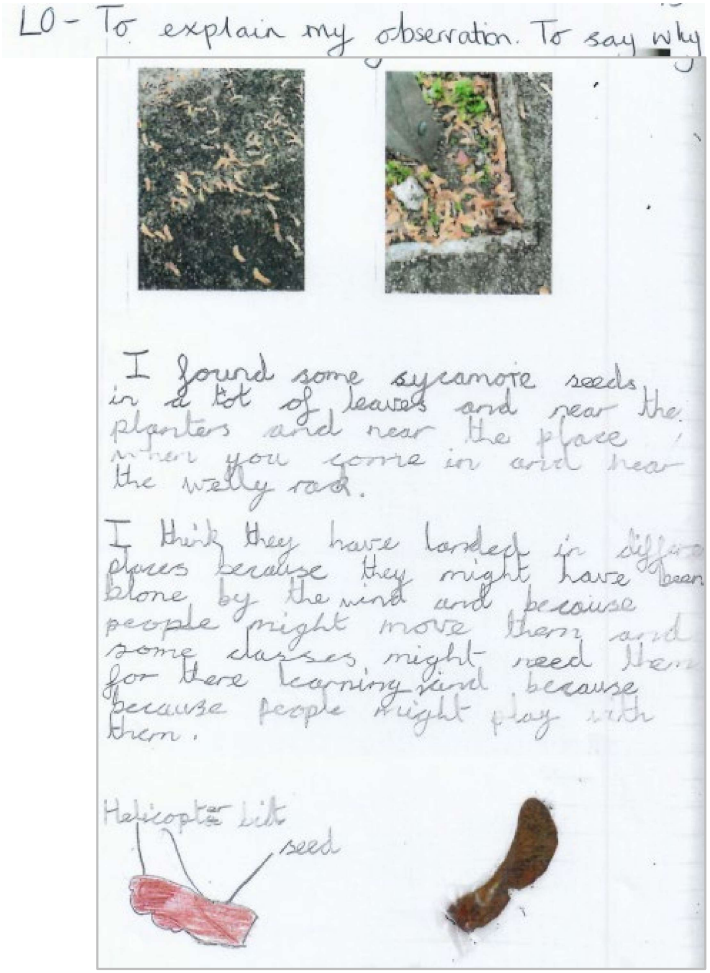
- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
- Recognise that soils are made from rocks and organic matter.

Potential Opportunities for Outdoor Learning – be selective rather than aiming to do everything.

Comparative & fair testing	**What happens to rainwater on different surfaces around our school grounds?** Use Water permeability | Education Nature Park to support this activity. Does all the water 'pool' in one place or 'soak in'? What materials help the rainwater soak in and avoid flooding? This activity will allow learners to compare different surfaces in nature, and how they can contribute to reducing flooding. The activity can be used to start a discussion about how we can adapt to properly face the challenges of climate change. It can also provide a link to the Practical Action project 'Pumpkins Against Poverty' in the PLANTS unit above. **Which soil lets the most water through? -** Potential to do outdoors: Collect a soil sample from the school grounds, another person's garden (brought into school) and another local outdoor space and compare with garden centre topsoil and shop bought compost. Compare what happens to the different soil samples when mixed with water, shaken and then left for 2 hours or more? Which soil is the best for our planting beds?
Observing over time	**What is soil made up of?** What happens to soil when mixed with water, shaken, and left of 2-4 hours? - Potential to do outdoors: Dig up/collect a soil sample from the school grounds. Observe what happens when mixed with water and left for 2- 3 hours? Label the different layers from an image of the results of the observation. What does soil contain – rock (when observed through a digital microscope, rocks and hard grains are present which might be shiny), water (forms a clump when squeezed in hands), air (air bubbles produced when mixed with a small amount of water), living things (seeds, moss, green leaves and minibeasts) and non-living things that were once alive (such as dead leaves, wood, dead minibeasts).
Pattern Seeking	**Do all headstones in the church graveyard change over time in the same way?** **Are the oldest headstones in the church graveyard the most weathered?** Visit a local church graveyard to identify rocks used for different purposes based on their properties (most hard wearing to least hardwearing) and say why based on their appearance and age/dates. Before entering a graveyard, discuss with the children how to be sensitive around the setting, care for the area and show respect when looking at headstones. Consider dates on different graves, the materials they are made of, and the amount of weathering occurred over time. Which headstones/materials have weathered the best over time? **Which rock is the most hard-wearing?** **Do different rocks used in different buildings show different signs of weathering/wearing away?** – potential opportunity to explore buildings in a local street/town. Children could collect evidence and signs of weathering as photographs to be sorted and discussed back in

	school. This could be liked to their results from a class-based activity to help inform their conclusions TAPS (Teacher Assessment in Primary Science) Rocks report
Problem solving	Considering how soil can be 'healthy soil' and how it is affected by weather and changes to climate - This lesson Lesson: Healthy soil (non-statutory Climate Change & Sustainability) | KS2 Science | Oak National Academy (thenational.academy) can be used to introduce an issue and then children could explore the Practical Action resource linked to 'Floating Garden Challenge' Floating garden challenge - Practical Action This is a longer project that would work well in a science day/event/week to enrich Y3 curriculum further.

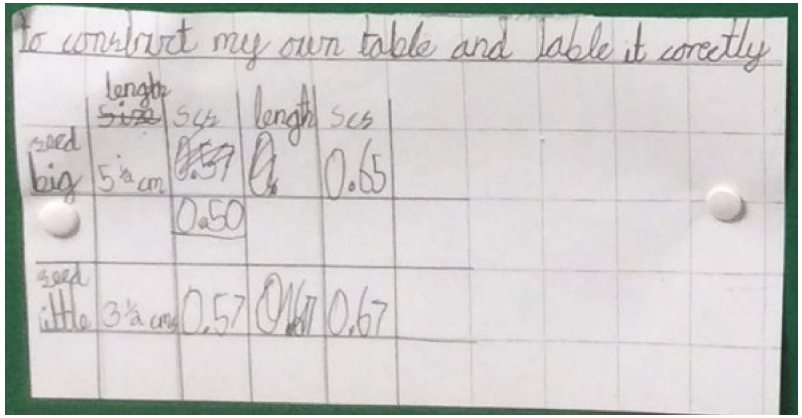
What children's work might look like – Y3

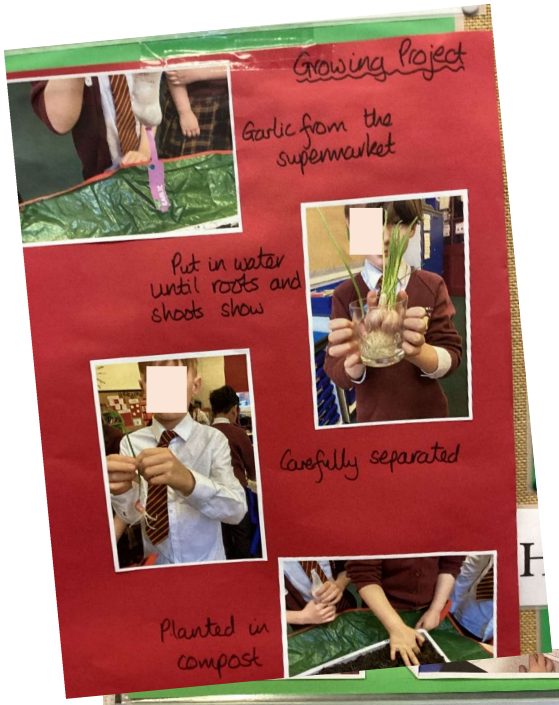


Observing plant life cycles (including seed dispersal) throughout the year.

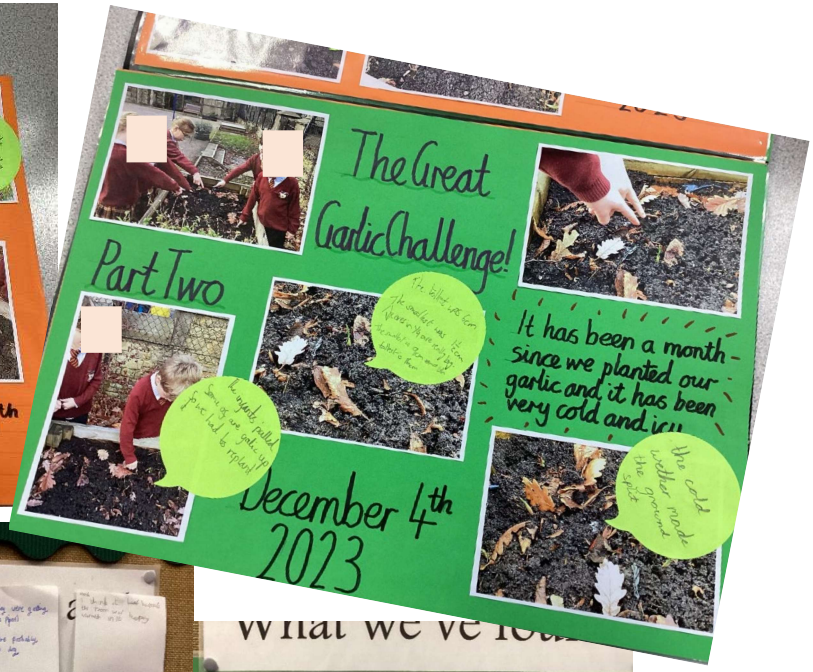
AUTUMN: Comparing seeds and testing how long they take to fall

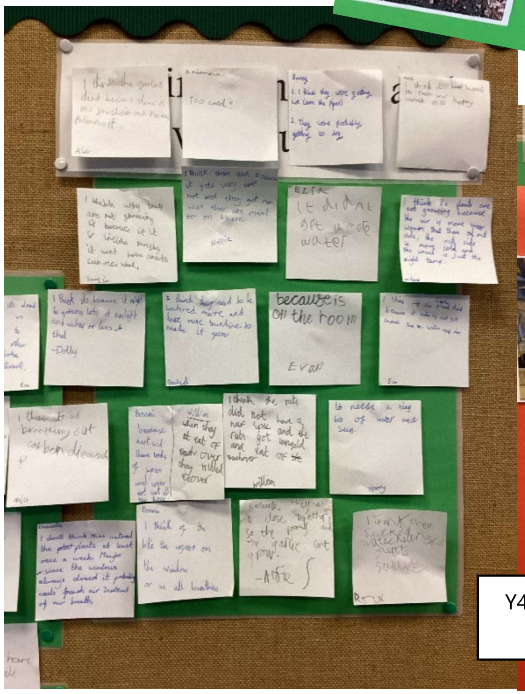
Y5-We have been measuring and comparing length and time. We have been using cm and seconds. We have been pattern seeking.

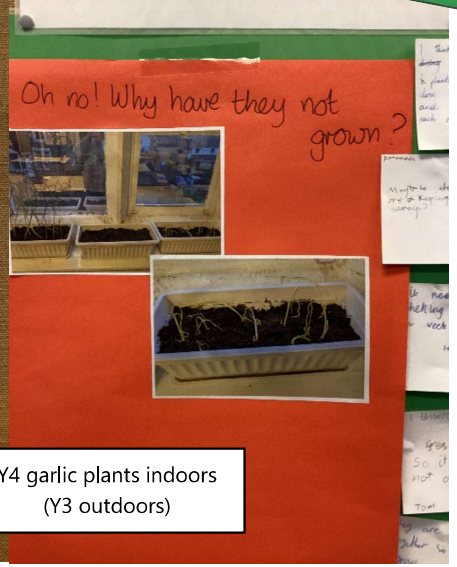




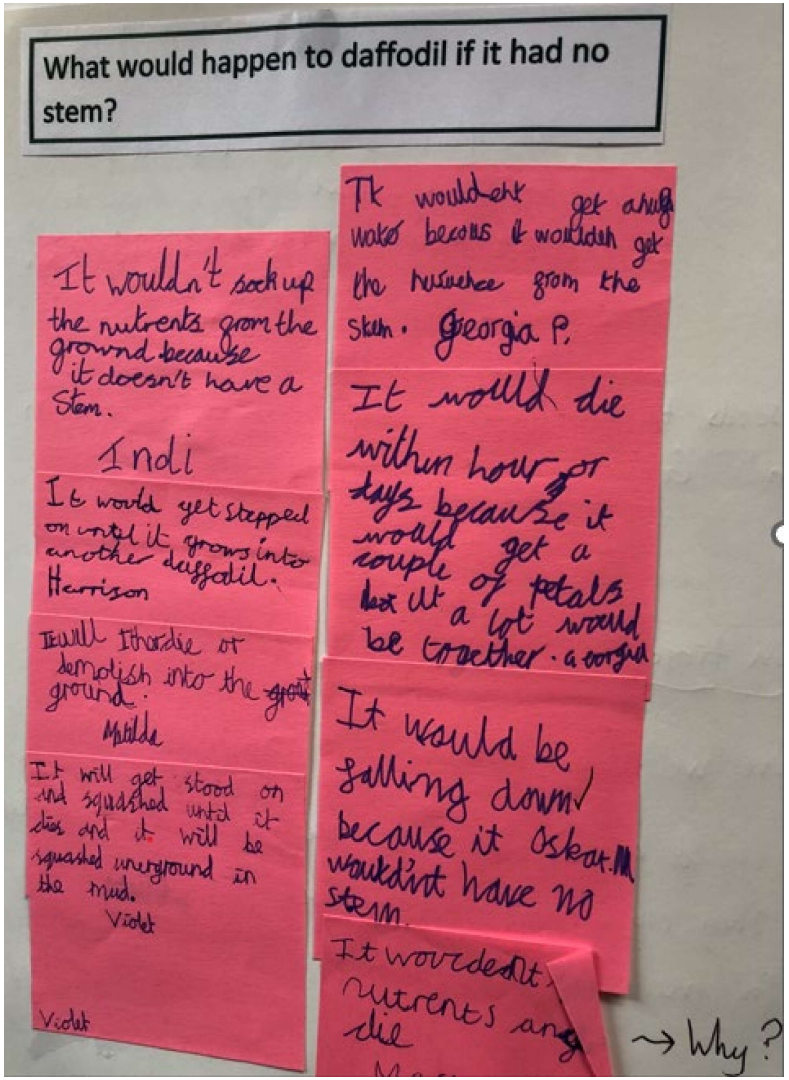
Comparing growing plants indoors and outdoors and in cold and warm conditions.



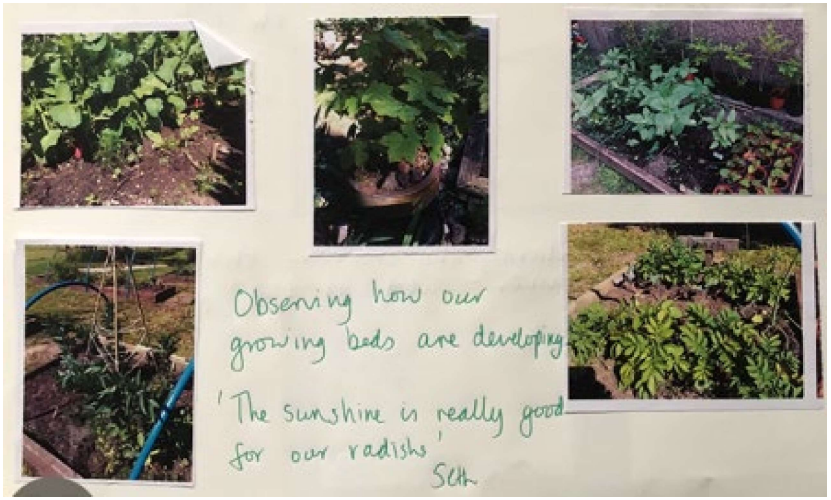




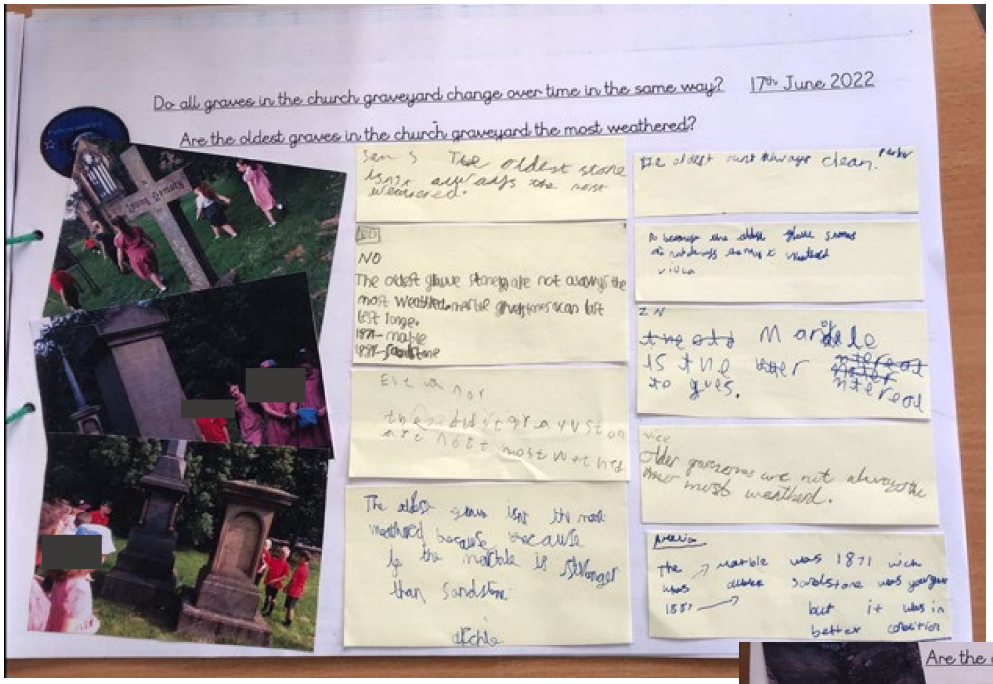
Y4 garlic plants indoors (Y3 outdoors)



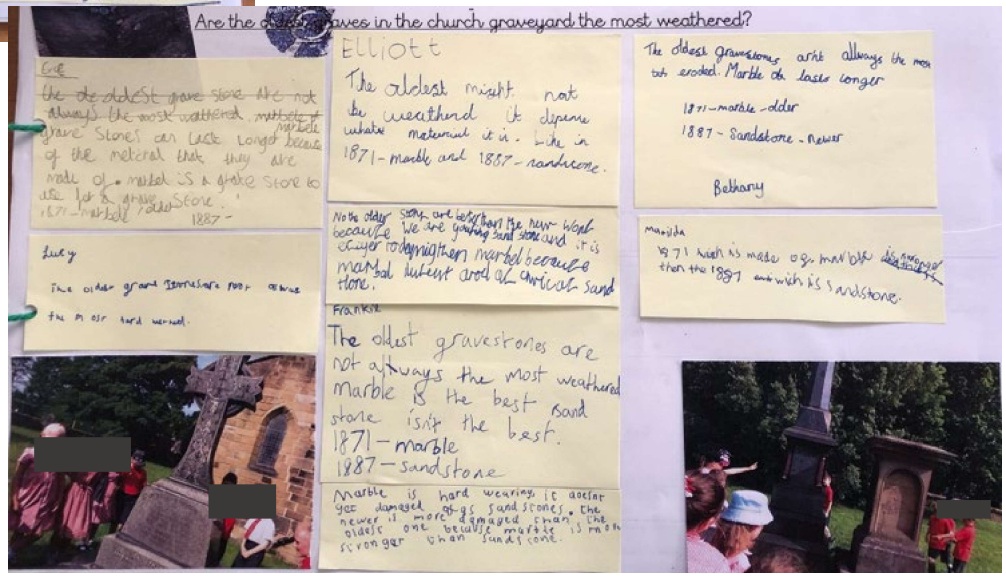
Using their observations of plants in the locality to stimulate thinking about the function of plant parts.

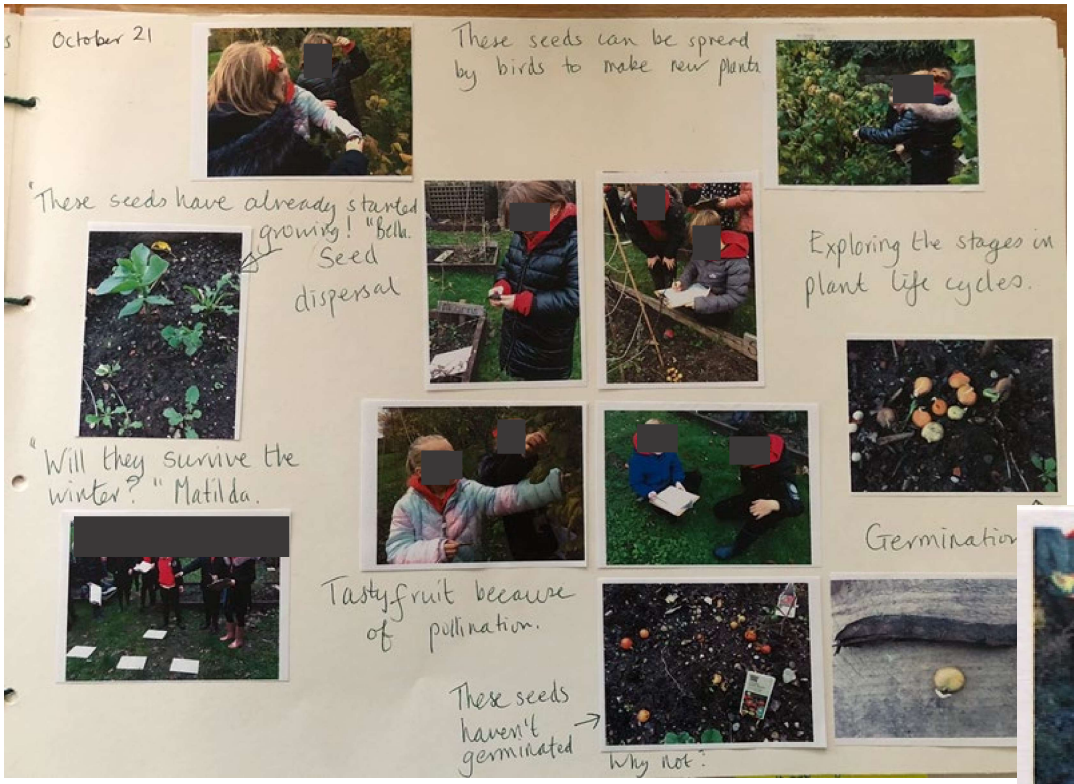


Y3 gardening and crop growing.

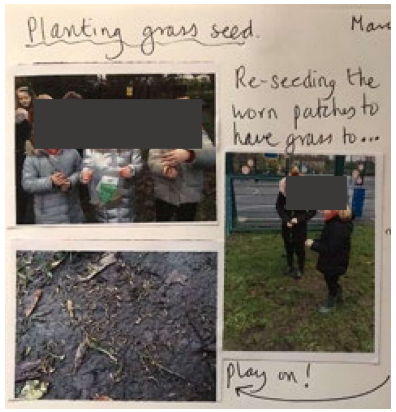


Observing and recording weathering of rocks in a local graveyard.





Whilst on a seasonal walk, the children discussed seeds and plant life cycles prior to their learning in the Plants unit later in the year.



Improving the school grounds with planting projects.

Gardening skills in Y3