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. 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. Mint 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** – produce flowers in 2-3 weeks and ripe seeds within 5 weeks.
- **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. When growing peas outside, give them a 'tent' of twigs for their stems to grow over.
- **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' 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? (Misconception: Some children believe the dandelion 'clock' seeds are just for show and don't always realise these are all potential new plants). Is the leaf arrowhead and pointed as soon as it appears after germination? Dandelions are useful 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 'cocks' is late Apr/early May.
- **Pumpkin seeds** can be a useful alternative to more familiar seeds such as sunflowers when studying plant life cycles. 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. 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 https://schoolgardening.rhs.org.uk/Resources/Activity/Make-a-measuring-stick and thinning them as they grow https://schoolgardening.rhs.org.uk/Resources/Activity/Weeding-and-Thinning-Flower-Seedlings 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 https://www.educationnaturepark.org.uk/resource/pollinator-count
- 'Point of View' of a bee from https://www.educationnaturepark.org.uk/resource/points-view

Improving our school grounds with more seed producing trees

- You can claim your free Trees For Schools from here https://www.woodlandtrust.org.uk/support-us/act/your-school/plant-trees-with-your-school/ 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 different Y3 topics:

- PLANTS: Nutrients and Fertilisers for Plants
  https://www.thenational.academy/teachers/programmes/science-primary-ks2/units/what-plants-do-and-what-they-need/lessons
- ROCKS AND SOILS: Considering how soil can be 'healthy soil'. This lesson https://www.thenational.academy/teachers/programmes/science-primary-ks2/units/rocks-and-soils/lessons/healthy-soil-non-statutory-climate-change-and-sustainability can be found in the 'Rocks and Soils' unit so can provide a great link to soil/fertilisers within another topic).
- 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? https://www.educationnaturepark.org.uk/resource/water-permeability
- HEALTHY EATING: Locally produced foods https://www.thenational.academy/teachers/programmes/science-primary-ks2/units/healthy-eating/lessons/local-food-non-statutory-climate-change-and-sustainability - 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 fresh food packaging such as fruits 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*) **all grow the same if planted in differing types of compost/in different areas of the school grounds? -** Outdoor or greenhouse/polytunnel opportunity (SUMMER) Consider this opportunity https://www.educationnaturepark.org.uk/resource/plant-investigations 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.
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). https://treecouncil.org.uk/seasonal-campaigns/seed-gathering-season/ (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 https://tinyurl.com/SEPSwork). 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.
Observing over time	**How far do dandelion seeds spread?** (SPRING esp. in May). See also 'Drifting Dandelions' from CREST SUPERSTAR resource https://primarylibrary.crestawards.org/all-superstar-challenges/61747644 (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 – May) **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 mint 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 used for the plant to make its own food from the sunlight. See also TAPS Investigation: Measuring plants **How much water do plants need?** When learning about what plants need to grow, it is worth revisiting seed germination introduced in y2. Seeds 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 from 'Education Nature Park - Bloom or Doom Seedling Game' https://www.educationnaturepark.org.uk/resource/bloom-or-doom-seedling-game **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 a section of grass that would not be cut and then observe growth over the

	course of several weeks. Does this 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). Plant wildflower seeds in APR, 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). **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 feeder using the Tree Tools for Schools and compare with real flowers. http://www.treetoolsforschools.org.uk/activities/pdfs/pdf_butterfly_feeder.pdf . **Where do dandelions prefer to grow?** (SPRING – May). Use a hoop or a science quadrant to survey different areas in the local area. Count the daisies in the hoop/quadrant and see which has the most. **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.
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. https://schoolgardening.rhs.org.uk/Resources/Activity/Make-a-herbarium-specimen **Can you research and find out about an unusual plant?** – This activity is *about the outdoors* rather than *in the outdoors*.

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.

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. Provides a potential link to physical activity. 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) **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) See also TAPS 'Investigating Skeletons' for a skill focus and lesson plan outline for this lesson.
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 foods 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?
Researching	HEALTHY EATING: Locally produced foods https://www.thenational.academy/teachers/programmes/science-primary-ks2/units/healthy-eating/lessons/local-food-non-statutory-climate-change-and-sustainability - 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 fresh food packaging such as fruits and vegetables).
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. 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.

Pattern Seeking	**Do all graves in the church graveyard change over time in the same way?** **Are the oldest graves 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, caring for the area and showing respect. Consider dates on different graves, the materials they are made of, and the amount of weathering occurred over time. Which gravestones/ materials have weathered the best over time? **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.
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 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).
Comparative & fair testing	**What happens to rainwater on different surfaces around our school grounds?** Use https://www.educationnaturepark.org.uk/resource/water-permeability 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. **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 and left for 2 hours? Which soil is the best for our planting beds?

Problem solving	Considering how soil can be 'healthy soil' and how it is affected by weather and changes to climate - This lesson https://www.thenational.academy/teachers/programmes/science-primary-ks2/units/rocks-and-soils/lessons/healthy-soil-non-statutory-climate-change-and-sustainability can be used to introduce and issue and then children could explore the Practical Action resource linked to 'Floating Garden Challenge' https://practicalaction.org/schools/floating-garden-challenge/ This is a longer project that would work well in a science day/event/week to enrich Y3 curriculum further.