

Climate School 180

Carbon Garden options for your school grounds

Introduction

Before you delve into action for carbon gardening in your school grounds, you should have completed the LtL School Grounds Climate Audit. This will have informed you about your school grounds, and the most pressing issues you should address.

You will also have had a discussion with a variety of stakeholders – pupils, staff, parents and community to agree on the priorities for climate mitigation and adaptation in your school grounds.

Why carbon gardening?

As a school you may have some spaces which you feel can be altered or better used to sequester more carbon. This may be replacing grass areas with trees, hedges, shrubs, flowers or meadows. You will typically have identified spaces which when altered will not compromise access to learning, play and sport, but instead may complement learning and play. Remember, our aim with carbon gardening is to sequester carbon into the soil, where it is more permanently locked away than in the trees, shrubs or plants we are choosing and seeing daily.

Before you agree on what approach you are taking, you will also have researched practicalities such as below ground utilities, emergency access and maintenance plans. This process will need approval from the site manager, to ensure that your new carbon gardens are enduring assets to the school.



Learning
through
Landscapes

This material is the intellectual property of Learning through Landscapes. Permission is given to use this material as provided for non-commercial and non-competitive use. Any use of this material should credit Learning through Landscapes. www.ltl.org.uk

You will also need to consider how your pupils can be involved in both the planning and implementation of a carbon garden, as a curriculum linked learning experience. You will also have considered how your pupils will interact with the new planting area, both for play and learning. It may be appropriate for pupils to have full, free access or it may be appropriate to limit access at times.

Possibilities for Carbon Gardening in School Grounds

Before you start, please undertake a soil test and speak to someone locally who can help advise on what that soil type means, and what your best options are for planting. Local gardeners, wildlife trusts, rangers, or local horticultural or agricultural colleges will be able to assist with this test and advice.

From mown amenity grass to meadows

Most school grass areas are a typical mix of amenity grass which we see all around the UK. This has two issues. Firstly, as our climate changes, the usual mix of grass may not thrive as well in future. Secondly, the current selection of grasses was not chosen with carbon sequestration rates or nature as a priority, instead things like durability and ease of mowing were priorities.

You can carefully choose which areas to change into meadows while having little impact on the amount of space available for play and learning. Areas include an unused corner, around sports pitches, 'orphaned' land in courtyards or adjoining carparks or road verges (etc).

Permanent meadows (sometimes called grasslands or ley), with their deep roots, long lifespan and huge carbon store in the soil, are very effective at sequestering carbon. There are differing types with 'herb rich meadows' being something that farmers use very effectively for both nature and improving soils, while also feeding animals.



There are three basic choices:

- Stop mowing areas of the grass. This simple step allows much more growth of the grass and plants you already have, encouraging deeper roots and using more carbon dioxide from the atmosphere. You will need to manage problem species, and while straightforward and cheap, the next few options offer more benefit in carbon sequestration, biodiversity and soil health.
- Change your amenity grass into a meadow by actively planting a wider variety of grasses and plants. A new meadow will introduce a wide variety of grasses, legumes (the beans and pea family of plants) wildflowers and herbs. The plants you choose will vary by your soil type and location, so take local advice on what to plant. They require planting and a maintenance plan.
- Plant a wildflower patch. These wonderful plants offer much in biodiversity terms and can sequester carbon more quickly than grasses alone, but they do have a cost in time and money to create and maintain. They are also less resilient than a meadow, with its greater diversity of grass, herbs, plants and flowers.

Plantlife offer an excellent few guides on meadows, and related guides on verges which are very relatable for schools. These guides include information on preparing soils, what species to plant, and how to maintain them. Find the information here:

<https://www.plantlife.org.uk/advice-learning/managing-grassland/>

From mown grass to trees, shrubs and plants

Your existing amenity grass has very shallow roots and only grows a few centimetres before it is cut. Introducing much larger plants, shrubs and trees dramatically increases carbon sequestration into the soil, as well as improving soil structure for drainage. Trees, shrubs and larger plants, over time, will sequester more carbon than meadows or wildflower patches and will often have even better root structures, improving soil quality deeper down. Larger planting adds further benefit through things such as improving water management, slowing windspeed and creating shade. As well as planting larger shrubs and trees, you will need to remove patches of existing amenity grass to plant the wider range of grasses, flowers and shrubs.



We would suggest that planting trees on their own is not best practice. By planting a mix of trees, shrubs, grasses, herbs and flowers you can dramatically improve carbon sequestration. By planting different tree species, which grow at different rates and to different heights also brings many advantages. Planting in this manner adds interest, with seasonal change and a more open structure to invite learners into the space.



Fruiting orchards, again with planting all around, also offer advantages, with seasonal changes, great learning opportunities and a need to plant the trees with more room around them which leaves space for plants and meadows around them. Read more about creating an orchard here: <https://ltl.org.uk/resources/school-orchards-advice/>

Again, consider your soil type and the amount of space required for the mature plants as you plan this, it is a great learning opportunity! Good advice is available locally from gardeners and wildlife trusts, perhaps a local horticultural or agricultural college.



Monoculture to mixed

You may be fortunate to have areas of trees and shrubs already. Many of these areas are of one type of shrub or tree, called a monoculture. By adding in different species, at different levels, with different seasonal growth, you can dramatically improve the soil and carbon sequestering effect. Survey your area with learners and then research what trees, shrubs, plants, herb rich meadows or wildflowers you can add to the area.

Planting under and around existing trees or shrubs is very effective. You do need to consider how much light can get through to the new plants, and this may require some pruning of branches or even removal of a few shrubs or trees. The plant species most likely to work are informed by your soil type, however looking for 'vernal forbs' (meaning spring herbaceous plants) is a good starting point. Plants include: garlic mustard, ramsons (wild garlic), betony, red campion, selfheal, woodsage, buttercups, hedge bedstraw and wood anemone or wood avens. You may also want to introduce more grasses, see the section above for more information on this.



There are however some considerations:

- Existing trees and shrubs will both shade from sunlight and cut down windspeed, and this will affect your plant choice.
- If you already have a very mixed area or heathland area, with good soil below (typically peat or, in lowland areas, sand) and a rich 'understory' of plants below trees such as grasses, heathers or mosses, then making changes will likely not improve biodiversity or carbon sequestration. A good survey of the plants and soil will reveal this, but you may want to seek local advice.
- If you do want to remove some trees or shrubs, find a way of leaving the wood or woody shoots in the area in stacks. They will both slowly decompose (keeping carbon on-site) and provide a home to wildlife.



From hard surface to growing

If your school grounds are mainly or only made up of hard surfaces such as tarmac, concrete or plastic grass. In spaces like this, any small areas you can introduce soils and planting will have a significant benefit in terms of sequestering carbon.

Using planters is an ideal way of doing this. It is much cheaper than digging into existing tarmac and you can use a variety of planters to create different effects. You can buy large planters, ask someone to build them to your design, or you may explore using barrels or upcycled containers. Containers should have drainage and still need to be positioned to get sunlight for the plants to grow.

Below are some ideas which may inspire you.



Containers still need some maintenance – regular weeding, watering in dry or hot conditions, pruning and replacement of plants at times. This can be something that you can work with classes to take on particular planters. You could turn it into a competition. Some schools also allow

pupils to maintain them during breaktime, pupils find this very positive and calming.

Soil Health Improvement:

All of the above improvements to your grounds will sequester carbon, but the most important store is your soil. Any new planting will benefit from soil improvement through actions such as adding compost and adding mulch around plants. Better soils lead to faster growth of trees, shrub and plants, which then in turn further improves the soil – a slow but powerful natural cycle.

Compost in schools needs to be treated carefully, and you should ensure that your source of compost does not include meat waste and is of a high quality. Even then, pupils should wear face masks if the compost is dusty and good hand hygiene (gloves and washing) should be enforced strictly.



Natural mulch is best, usually bark chip or similar. A good mulch layer will retain moisture, decompose into the soil slowly, add carbon, and provide a home for helpful bugs and bacteria which will improve soil health further. It does need replacing at times, and pupils can be actively involved in the process of moving or adding mulch.

Useful links:

[RHET Soil](#)

[Soil Association](#)

Low-Carbon Maintenance:

Once you have created your carbon garden, you'll be ready to start your maintenance plan. The good news is that most of the suggestions above involve less grass mowing, which typically uses fossil fuel powered machines. This may be that you stop all mowing in some areas, or reduce the amount of mowing down to a couple of cuts a year.

Remember if you don't mow at all different plants will come in on their own accord – this is succession. Ultimately this would end up as woodland but this is not a fast process and



you may end up with lots of brambles on the way. So think carefully before you decide on the best option for your grounds.

Try to keep organic matter on site and compost it down where possible. If most of the organic matter is grass (very nitrogen rich) it will require additional carbon to be added. This ideally is in the form of chopped up woody stems, woodchip or sawdust, but can also come from shredded paper recycled from the classroom.

Pupils can be involved in communicating with whoever is involved in purchasing the maintenance. This can be by helping mark the areas with information signs for all users, and posting warning signs for mowing contractors.

Pupils can also get involved by inviting contractors into school and making a presentation about their work to develop the school grounds. This can include asking the contractor about how they approach sustainability – from the work they do and how they protect nature, to swapping to low emissions mowers or battery tools.

Case Study

The case study below aims to inspire you and to visualise what is possible, through a real-life example of a school that has implemented carbon sequestration strategies.

Case study: Irma Coulson Public School

Located in Ontario, Canada, Irma Coulson Public School has over 1,000 pre-school and primary school pupils. The school's recent playground upgrades prioritised sustainability and nature positive designs, which significantly increased carbon sequestration, while lowering climate-related impacts. By incorporating native Canadian plants and using regionally sourced materials, the project purpose was to create a space for nature, education and play. The result is a heat-adaptive and water-sensitive school ground that fosters meaningful outdoor learning experiences and is a fantastic place for all the pupils to play in.



The key challenges identified through site analysis showed:

- Lack of shade, shelter, and seating
- Flooded playgrounds due to compacted and unhealthy soils
- Few trees, in a poor state of health
- Expansive areas with little opportunities for play and outdoor learning

The solutions proposed to these challenges were based on themes of nature-positive design, nature-play, and learning, ultimately increasing the carbon sequestration through new areas of planting:

- Over 45 trees were planted
- Large areas were planted with shrubs, such as willows which is fast growing and flexible, this enables children to play with their stems, without breaking.
- Natural materials, sourced locally, in the furniture and play equipment were also used to reduce the overall carbon footprint of the new design



Irma Coulson Public School - Ontario, Canada