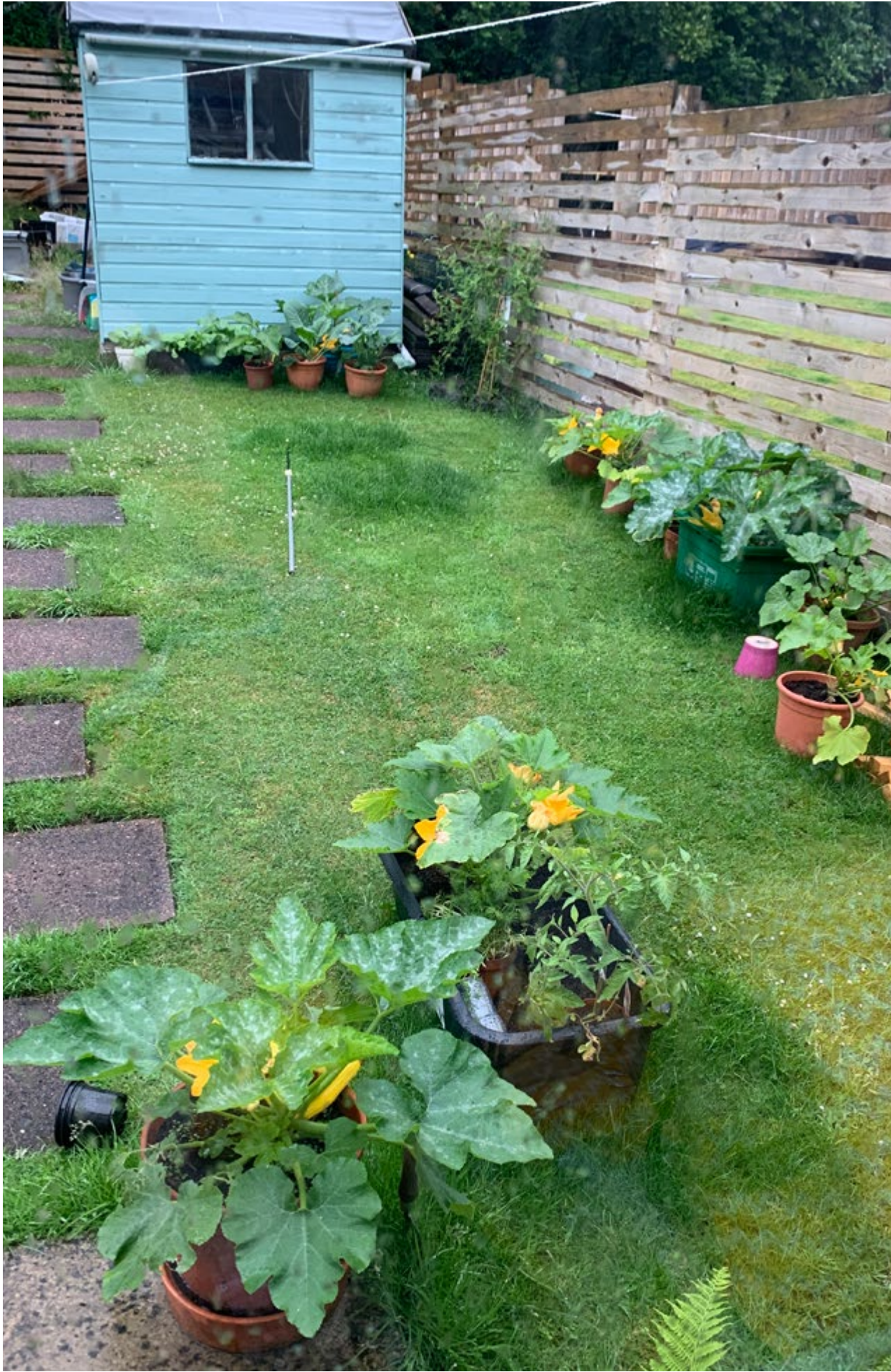


The background image shows a school greenhouse. In the foreground, there are several raised wooden beds filled with young green and red-leafed plants. To the right, a wooden workbench holds various gardening tools, including two green watering cans and a colorful striped bag. The greenhouse structure is made of metal poles and translucent plastic sheeting. A semi-transparent text box is overlaid on the left side of the image.

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Design elements for school grounds

Food growing



Food growing



Food growing areas can be established in different ways, small or large. From simple beds to raised gardens or covered structures such as a polytunnel or greenhouse.

Food growing has many educational benefits in supporting the Curriculum for Excellence. This includes developing practical skills, understanding scientific processes, and promoting health and wellbeing.

This document provides a range of ideas for how food growing can be developed in school grounds.

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Planting beds on existing lawn or soil

Installing planting beds on existing lawn or soil is the easiest and most cost effective way to install a food growing area. By working with the pupils to plan and design the space, you can decide the ideal area, perhaps developing underused spaces in the school grounds to enhance biodiversity. The main thing to consider when planting straight into the ground is getting the land tested for contamination. You can do this by speaking to your local authority for further details.



materials

Lay down cardboard over the soil to suppress or kill existing weeds or plants.

Add approximately 250mm depth of new topsoil to the growing area.

Use approx. 100mm depth of bark mulch to cover surrounding paths.

Once the ground is prepared, you will need the selected seeds and plants, as well as basic gardening equipment.



estimated time

To kill off grass using cardboard, allow 3–6 months for decomposition. The cardboard must be thoroughly soaked and covered with mulch to prevent it from drying out.

For planting in early summer, begin this process in late winter or early spring.



maintenance and lifespan

Regular weeding and watering are essential. Tending will vary depending on the fruits or vegetables selected.

Watering is especially important during hot, dry weather. As many crops require harvesting during the summer holidays, consider planting varieties that need minimal summer maintenance.

By regularly adding organic matter to the soil, the growing area can remain productive for 10 years or more.

Design considerations

Could the ground be contaminated? Ensure soil testing is undertaken.

Does the area get enough sunlight?

What size of growing area is required and can it be maintained?

Food growing requires regular watering. How close is the nearest water source (either tap or rain water)? Can this distance be easily walked by pupils carrying heavy watering cans? Is the food growing area located away from active play areas (i.e. ball play, running)? Is there good surveillance from the school or other neighbours to reduce chance of damage or vandalism?

Is a boundary required for delineation from other activity areas or for keeping animals out?

Can tools be stored close by?

Technical considerations

Implementing planting beds is best done in spring or autumn.

Legal considerations

Consider speaking to the local authority regarding ground contamination.



estimated costs

The cost to establish three 5m² planting beds, each surrounded by 0.8m-wide mulch paths, is approx. £350.

Recycled cardboard can usually be sourced for free.

Topsoil, bark mulch, and seeds or fruit trees may be available at reduced cost through your local authority.

**see 'Costings note' on p.24*



further ideas

Extend the growing season and plant for variety of fruits and vegetables by using a greenhouse or polytunnel.

Use lollipop sticks to get the pupils to design seed labels.

Consider how the area can be wildlife friendly by including, bird and bat boxes, and insect hotels.



labour and skills

Gardening skills are required for preparing and maintaining the growing area. If you are building a greenhouse, basic construction skills are needed. Installing a polytunnel may also require DIY skills.

Planting beds on existing lawn or soil

Existing situation

A school ground has lots of grass or lawn that is currently not being used for any form of activity or opportunity for learning.

Proposed activity

To foster both student learning and community engagement, the school is transforming a section of its grassy area into a planting bed. This space will allow pupils to cultivate vegetables and herbs while also providing a shared garden for the surrounding community.



To prepare the area for planting, the school is covering the existing lawn with cardboard to suppress weeds. This eliminates the need for tilling or weeding before the new topsoil is added.



Here, we can see that the topsoil has been arranged into parallel rows or plots after the section has been prepared. Setting it up this way provides designated pathways that protect the growing plants from being trampled by students, teachers, and community members as they water, prune, or maintain the garden.

Raised beds or planters

Raised beds and planters can be built on hard surfaces or as moveable structures. They can be constructed at different heights to more easily facilitate gardening and to improve accessibility for children in wheelchairs or with mobility restrictions by incorporating leg recesses.



materials

Use timber to build planters. Other materials such as bricks or metal sheets can also be used.

To reduce the need for importing large amounts of new subsoil and topsoil, planters can be layered with natural materials such as large logs, branches, twigs, leaves, or raw compost, topped with approx. 150mm of topsoil.

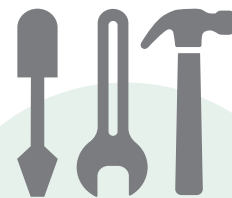
Water the planter thoroughly and allow it to settle for a few days before planting or seeding.



labour and skills

Gardening skills are required for planting and ongoing care.

Construction skills or support from a joiner will be required to build the planter.



maintenance and lifespan

Regular weeding and watering are essential, especially during warm and dry weather, as raised planters tend to dry out more quickly than in-ground beds.

Many vegetables require harvesting during the summer holidays, so consider selecting varieties that need minimal maintenance at that time.

Softwood treated sleepers typically last 5–10 years, while hardwood oak sleepers can last 30 years or more.

Design considerations

Consider whether the size and height of planters is suitable for accessibility.

Does the area get enough sunlight?

What size of growing area is required and can it be maintained?

Planters dry out quicker. Consider slow release water equipment (e.g. filling an empty water bottle and placing it upside down in the soil).

How close is the nearest water source (either tap or rain water)? Can this distance be easily walked by pupils carrying heavy watering cans?

Is the food growing area located away from active play areas (i.e. ball play, running)?

Is there good surveillance from school or other neighbours to reduce chance of damage or vandalism?

Is a boundary required for delineation from other activity areas or for keeping animals out?

Technical considerations

If upcycling, ensure the materials used are suitable for growing edible plants.

Legal considerations

Permission or sign off by local authority may be required for any self-build elements.



estimated time

Designing the planting area may take approx. one month.

Implementation typically takes between 1–4 weeks, depending on the scale of the project and the number of volunteers involved.



estimated costs

A timber planter measuring 4m x 1m x 0.8m, filled with 500mm of subsoil and 300mm of topsoil, may cost approximately £3,500.

***see 'Costings note' on p.24**



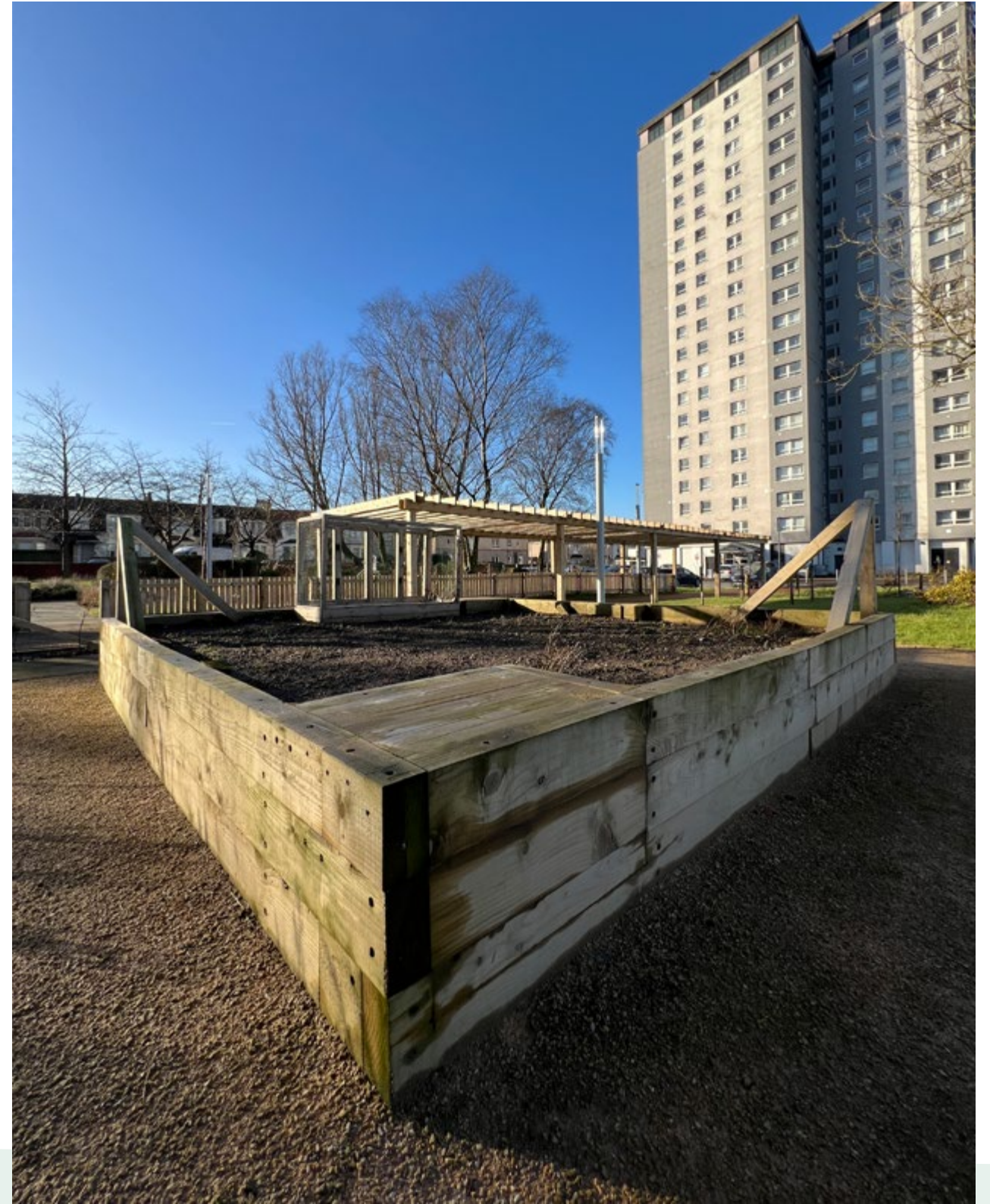
further ideas

To keep costs down, consider upcycling old containers such as filing cabinets, barrels, metal baths and troughs. Ensure drainage holes and linings are added.

Raised beds or planters



This image demonstrates the effective use of a tarmac area for gardening. While currently showcasing flowers, this raised border could easily be adapted by a school to grow herbs or specific vegetables suited to this type of environment.



This raised garden bed, constructed from repurposed railway sleepers, offers a great solution for schools. Sleepers are readily available and simple to work with, making building and maintaining the beds straightforward. Their robust nature creates a clear boundary, preventing students from accidentally trampling or disturbing the plants growing within.

Greenhouse or polytunnel

A greenhouse or polytunnel allows for an earlier start to the growing season and the growing of plants that are not suited to our outdoor climate (e.g. tomatoes, cucumber, peppers). In addition, these structures can also function as outdoor classrooms.



materials

Greenhouses can be purchased directly from suppliers.

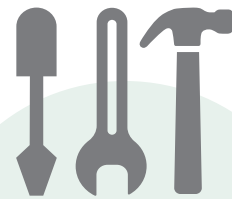
Alternatively, you can build a greenhouse using a timber frame and recycled plastic bottles. Building instructions for this method are available at: www.reapscotland.org.uk



estimated time

Off-the-shelf greenhouses will depend on the supplier's timeframe.

A recycled plastic bottle greenhouse will take longer and depends on how quickly your school can collect the required number of bottles. See the example under 'materials' for further details.



maintenance and lifespan

Follow the manufacturer's guidance for maintaining greenhouses and polytunnels.

Regular maintenance checks are important, especially after extreme weather.

Clean greenhouse glass and structural elements regularly to remove debris and extend the lifespan.

Polytunnel frames can last 15–20 years if properly maintained and constructed with quality materials. However, the polythene cover may need replacing every 5–10 years due to UV damage and general wear.

Design considerations

Could the ground be contaminated? Ensure soil testing is undertaken

Does the area get enough sunlight?

What size of greenhouse or polytunnel is required and can it be maintained?

Food growing requires regular watering. How close is the nearest water source (either tap or rain water)? Can this distance be easily walked by pupils with heavy watering cans? Can rain water collection be fitted to the greenhouse?

Do not locate greenhouses or polytunnels close to play area with ball sports to avoid potential damage to structures.

Is the greenhouse or polytunnel located with good surveillance from school or other neighbours to reduce chances of vandalism?

Further guidance can be found here: www.schoolgardening.rhs.org.uk

Technical considerations

A level surface is required. Depending on the greenhouse, concrete foundations or slabs might be required for posts or corners.

Legal considerations

Insurers usually require any roofed structures to be at a minimum distance of 8–10m from any building (for fire safety).

Building warrant permission for structures over 8m² may be required.

Planning permission may be required.

Permission or sign off by local authority may be required for any self-build elements.



labour and skills

Constructing a greenhouse requires basic construction or joinery skills.

Gardening skills are also useful for ongoing use and maintenance.



estimated costs

The cost of a greenhouse will vary depending on size and type. Prices from suppliers typically start at £1,000.

A domestic polytunnel (approximately 36m²) may start at around £400.

***see 'Costings note' on p.24**



further ideas

Consider grouping all growing elements together to create a gardening zone within the school grounds.

Greenhouse or polytunnel



In this example, a school uses recycled plastic bottles to create a greenhouse. This demonstrates ways of creatively repurposing existing materials.



Here, we see a narrow polytunnel to maximise the use of the space beside the raised garden beds.



In this example, a school has a wide polytunnel to grow vegetables and has a seating area outside to provide a space for learning.



In this example, a narrow polytunnel is used to store equipment whilst also providing a space to grow vegetables.

Compost bin

A compost area allows you to turn plant material into free nutrients, that can be put back into the ground to enhance food growing by enriching the soil. Avoid composting any food which may attract vermin.

Consider designing two to three compost bins to use in rotation, as compost will take several months to decompose for usage.

Start your compost bin when your garden yields ample material, ideally in spring. A well-designed bin will control rain, maintain warmth, allow drainage, and ensure proper air circulation.



materials

Use timber or reclaimed pallets to build a compost area, or purchase a ready-made plastic compost bin.



labour and skills

Basic construction skills are needed if building your own compost bin, or consider involving a joiner to support the build.



estimated time

Building or installing a compost area can typically be completed in one day.

Design considerations

Ensure the compost bin:

- has an open bottom for drainage
- is positioned in half shade and is easily accessible
- is large enough to take the anticipated waste
- has 2–3 compartments or bins to switch over annually

Consider the distance to food growing or gardening area.

Further guidance can be found at: www.schoolgardening.rhs.org.uk

Technical considerations

Not applicable

Legal considerations

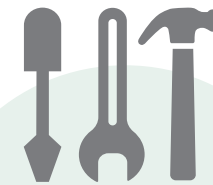
Not applicable



estimated costs

Pallets can often be sourced for free. Plastic compost bins typically range from £20–£200.

**see 'Costings note' on p.24*



maintenance and risk

Check the compost area regularly for wear and tear.

Avoid composting food waste, as this may attract mice or rats.



further ideas

Place compost bin adjacent to food growing area, ideally in a semi-shaded and well-drained area.

Composting

Introduction to composting

Composting involves layering nitrogen-rich “green” materials with carbon-rich “brown” materials in a bin or pile. Maintaining consistent moisture and aerating the mixture through regular turning will yield fertile soil within a few months.

For more information on composting, visit:

www.schoolgardening.rhs.org.uk

Green (nitrogen-rich) materials

- fruit and vegetable scraps (avoid meat, dairy and oily foods)
- coffee grounds and filters
- eggshells
- grass clippings
- weeds (before they go to seed)
- leafy plant trimmings

Brown (carbon-rich) materials

- dry leaves
- shredded paper or cardboard
- straw or hay
- sawdust or wood chips
- dried weeds



This simple DIY compost area is ideal for a school setting. Constructed with wooden slats to contain the compost, it also utilises a cardboard cover to suppress weed growth and help retain moisture. This is a cheaper alternative than buying plastic bins. Pupils, teachers or gardeners can collect leaves and any other organic material around the school ground to top up their compost.



Here is an example of creating different growing zones for school grounds.

Rainwater collection

Plants need the most water during hot, dry, and windy weather. Fitting a rainwater collection butt to a drainpipe may provide an additional water source. This is especially useful during periods of drought or when water restrictions are in place. Rainwater is also naturally soft and slightly acidic, which is beneficial for many plants. Additionally, collecting rainwater could help reduce runoff, erosion, and water buildup on the school grounds.



materials

Consider re-using existing storage tanks and installing guttering (if not connecting to an existing drainpipe).

Water butts can be purchased directly from a supplier.



labour and skills

Basic construction skills are helpful for installing water collection systems or connecting them to a drainpipe.



estimated time

If building the system yourself, installation can usually be completed in around one day.

Design considerations

For health and safety, consider a secure lid that cannot be opened by pupils. Consider distance to growing or planted area to reduce carrying heavy watering cans.

Technical considerations

Ensure water butt is installed on a stable surface to avoid easily toppling over.

Legal considerations

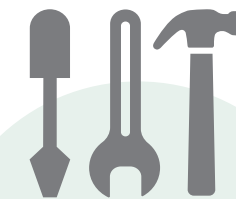
Not applicable



estimated costs

A basic water butt can be purchased for under £50. More elaborate constructions will involve higher costs.

***see 'Costings note' on p.24**



maintenance and lifespan

Clean gutters regularly, especially in autumn when they may fill with leaves. To reduce maintenance, consider installing a hedgehog gutter brush to prevent leaf buildup. Above-ground plastic water tanks typically have a lifespan of 20–30 years.



further ideas

Position planting beds or flowers near your rainwater collection system to make watering easier.

Rainwater collection

Existing situation

A school's food growing area, comprised of raised beds and a greenhouse, faces challenges due to increasingly frequent and heavy rainfall. These periods of waterlogging often render the area inaccessible to students and teachers. On the other hand, the school also experiences periods of drought, resulting in water shortages that hinder plant growth and require careful water management.

Proposed activity

Given the challenges of both waterlogging and drought, the school is investigating rainwater harvesting as a solution. They are considering a large collection tank to manage the heavy rainfall and provide a reserve for drier periods. The examples on this page showcase a variety of rainwater collection systems that could be adapted in scale for a school environment, offering potential inspiration and solutions.



This largescale example shows multiple 1000-litre IBC containers that collect water from the drainpipes. This is a really good example of collecting high quantities of water. The containers are placed above a timber-built deck beside the building, out of the pupil's reach.



This example demonstrates a smaller-scale rainwater collection system, utilising a single downpipe and a container elevated on a metal frame, safely out of reach of pupils. This approach is ideal for localised collection and can be replicated in multiple locations around the school grounds as needed.

Image credits and acknowledgements

This resource has been produced in collaboration with Urban Pioneers.

Cover: Wester Hailes Growing Communities

Page 2, 11, 15, 23: Architecture and Design Scotland

Page 6 and 7: Alan Gordon

Page 10, 14, 18, 19, 22: Wester Hailes Growing Communities

Costings note: Please note that all pricing information contained within these design guidance reflects estimates based on market conditions as of the 2024-2025 period. Due to the dynamic nature of industry costs, including material fluctuations and evolving labour rates, these prices are subject to change.

Explore our other resources related to design elements for school grounds

This resource is part of a series of six documents looking at design elements for school grounds. Each document focuses on different parts of our school grounds and provides design ideas on how to enhance them for activities and learning. Other topics are:

- enhancing surfaces
- furniture and shelter
- planting and gardens
- play and outdoor learning
- rain gardens

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