



Science

Key stage 2

grow it

Curriculum links



Sci-Scientific enquiry

Ideas and evidence in science

- Creative thinking is encouraged and pupils are asked to consider novel solutions to problems in the garden:

For example, how to prevent slug damage to crops without the use of chemicals. Is it more effective to catch slugs by making simple slug traps, encourage natural predators by making areas in the garden for hedgehogs and frogs to live, or to provide a barrier between the crops and the surrounding soil using fizzy drinks bottles placed around young plants?

- Links between cause and effect are discussed regularly with pupils: why do plants grow towards the light, why do plants die if not given sufficient water / light, why should we eat healthily?
- Ideas can be tested using the evidence that pupils record (see below).

Investigative skills

- Pupils should be involved in the planning of the vegetable garden, deciding which plants to grow and researching whether they need any special conditions for growth:

Where a greenhouse is available children can decide if the plants will benefit from being grown outdoors or in the greenhouse. If they are not sure, some can be grown indoors and some outdoors to compare both growth over time and eventual harvests.

Should seedlings be sown direct (outside) or started indoors and moved outdoors once growing?

- Pupils should be encouraged to ask questions scientifically (hypothesis), decide on both an appropriate method to test the question and which results need to be taken. They then draw conclusions from the results:

For example, will leaves compost faster if exposed to the elements (in a net leaf bin) or if contained in a sealed environment (black bag)? How will we decide which composted the fastest and why we think this happened?

- How do we find out information?

We can research using seed packets, catalogues, books and the internet.

We can collect results from first hand experience. Pupils decide what to record, ie how to record plant growth and what observations are relevant to the experiment.

- Using tools. Pupils should be introduced to the tools for gardening and how to use them safely. They are then asked to choose tools for specific tasks:

Pupils choose which tools are appropriate / necessary when carrying out gardening tasks such as planting seeds, potting on plants, planting outside.

- Devising a fair test and recording results. Pupils are asked to decide on an experiment, and then to discuss what measures they will take to ensure that the test is fair:

When running an experiment to compare the effect of different conditions pupils can be asked to consider which factors must remain the same and which are altering.

- Using a range of methods to represent data. Pupils can be asked which methods would be suitable to present their findings from experiments:

Some experiments will only have 2 results, others more numerous. For example, asking pupils to choose their favourite fruit or vegetable will result in numerous results which could be represented as a table, bar or pie chart.

Sc2 – Life processes and living things

Life processes

- Pupils are taught how plants grow and the differences between plant and animal life cycles:

Why don't seeds germinate in the seed packets? What do they need for germination?

Plants cannot move to find food and water so must create their own food in-situ and make use of available water in their immediate vicinity.

Once crops are growing pupils study all stages of their development, including flowering, reproduction and seed production.

Pupils learn that the majority of crop plants complete their life cycle in one year and that many of the edible parts of the crops are actually the plants primary method of reproduction.

Humans and other animals

- Learning about exercise and healthy eating:

When working in the garden pupils are exercising, which increases heart rate and contributes to overall health.

By growing their own food organically, pupils can learn about its benefits compared to growth using pesticides and chemicals.

Pupils can learn about eating '5 a day' and how this can benefit their health.

Green plants

- Pupils learn about the parts of plants, and their role in plant growth. They also learn that we eat different parts of plants:

Pupils identify leaves, stems, roots, fruits and flowers. They learn to explain why each part is necessary and the role that they play in plant growth / nutrition.

Pupils can discuss which parts of some common crops are edible: leaves = salad, spinach; stem = celery; root = beetroot, carrot; fruit = apples, pumpkins; flowers = broccoli, nasturtium.

Pupils learn why it is important for plants to reproduce and that flowering plants often rely on insects / mammals to assist with pollination and seed dispersal

Variation and classification

- Pupils use basic keys to show relationships within plant families and to identify species:

The concept that some crops (leeks, chives and onions, for example) are related can be introduced.

Simple keys can be used to work out whether an animal is an insect, spider, slug or snail

Living things in the environment

- Pupils learn to recognise different animals and plants in the local environment and learn their names.

When working outdoors pupils encounter many insect and animal species, discussing them as they occur. They can also learn to recognise how animals adapt to the environment

- Pupils learn that plants are involved in all food chains:

Plants tend to form the primary point in all food chains and without them nature would not be so varied.

- Pupils learn that not all plants will grow outdoors in the UK and why this is so. The concept of tropical plants can be introduced, as well as the role of sunlight and artificial environments such as poly tunnels and greenhouses:

Many pupils wish to grow melons and oranges, but as these require lots of sunlight or an artificial environment they are not suitable for schools.

- Pupils discover that micro-organisms are located in the soil, but are too small for us to see them. We can, however, see their effects:

Micro-organisms are involved in creating compost.

Learning to wash hands after working in the garden to prevent illness.



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Curriculum links

Sc3 – Materials and their properties

Grouping materials

- Describing rocks and soils based on their characteristics:

Pupils can examine varieties of soils and, using a simple key, work out what is its main constituent and what implications this has for the soil's properties.

Pupils can also look at types of compost and discuss the environmental implications of using homemade compost as opposed to shop bought.

Changing materials

- The role of the water cycle in the garden and wider environment:

Pupils learn what the water cycle is and that water is a finite resource. They will also learn how

to save water, both at home and also for use in the garden.

- Pupils can be taught how some materials can be changed by decomposition, whereas others remain unchanged and should be recycled where possible, ie glass, metals and plastics.

Separating mixtures of materials

- Pupils learn to use a sieve to separate large particles of soil from compost:

When planting small seeds the soil must be sieved to remove large particles which could prevent the seedlings growing through the soil or putting down roots. This is not required when re-potting established plants.

Sc4 – Physical processes

Light and sound

- Learning that light cannot pass through some materials and that this creates shadows:

Pupils learn the importance of aspect when choosing locations for the garden and how buildings / trees can affect the shadows formed.

The earth and beyond

- How the position of the sun changes through the day / year and how this effects shadows:

During the winter the sun is lower in the sky, creating larger shadows.