Mapping and site survey

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Royal Horticultural Society

growit Activities

Overview

Before we begin to dig the soil and start growing crops, we need to know what our site is like. Now, you all probably can picture the area in your heads, but what do you really know about it? We need to conduct a site survey – finding out about every aspect of the plot, from soil to weather to wildlife. The more carefully this is done, the less likely we are to make time-consuming and expensive mistakes. Once we have done our initial surveys, we can begin growing vegetables and fruits, but we will need to keep recording things in the garden like wildlife, sun and shade at different times of the year, temperature, rainfall and wind.

Materials

Essentials

- Notebooks or clipboards and paper
- Pencils
- Measuring tape

To measure temperature

- Min / max thermometer
- A nail
- A hammer

To measure rainfall

- Large plastic drink bottle (2 litres is ideal)
- Smaller plastic bottle (500ml is ideal)
- A pair of scissors
- A trowel or border spade

To measure wind

- A pen top
- A plastic drink bottle
- Card
- A knitting needle
- Matchsticks
- A cork
- Sand
- Blue tack

To measure soil texture

- Several jam jars, with lids
- Water

To measure soil pH

- pH test kit

To measure earthworm population

- Washing up liquid
- Water
- Watering can

Action

The first thing to do is to draw a map to show all the permanent features. To do this you first need to make a rough sketch of the area on a large piece of paper. Don't measure anything yet, but mark down boundaries such as fences or hedges, school buildings that are close by, the gate into the garden, and features already in the garden, such as trees, shrubs, ponds or habitat piles.

Next you will need to measure everything from two fixed points (such as the corners of the fence, or known points along the fence). This will give us a more accurate sketch of the site that can be drawn in class as the master plan your teacher. When you come to do this master plan, choose a sensible scale and draw an arc with a pair of compasses from each fixed point (the points along the fence) to the feature in question. The point where the arc intersects will give you its exact location. Record all this on your master plan and make several copies.

Mapping light and shade

Use some of these copies to chart the changing light and shade patterns through the day and, later, through the year. You may notice large differences between the summer and winter.

Knowing how the shadows move will enable you to make important decisions such as where to grow sun loving plants or where to put a seat.

Temperature

Light and shade patterns are easy to see, but for temperature we will need a thermometer that shows us the maximum and minimum temperatures reached in the garden. Positioned on the fence, the thermometer will give us the highest and lowest temperatures that occurred within whatever time has passed since it was last read and re-set. Recording these two values on a year long graph shows you the differences between day and night, summer and winter, and provides a guide to what kinds of plants we will be able to grow.

Rainfall

Plants need water to grow. While you will be able to give them extra water from a hose or a watering can, it is important to know the amount of rain that falls on your garden at different times throughout the year, and to note any differences in rainfall across your site. So you need to note whether there are dry areas and wet or damp areas, as this may influence your choice of plants. It's easy to measure rainfall by means of a simple rain gauge, made from a flat-bottomed plastic bottle.

Cut around the neck end and reverse this section to create a funnel. Sink the bottle into the soil. Each day or week you can lift out the funnel and measure the depth of the water with a ruler. If you plant more rain gauges in a variety of positions, such as under trees and next to hedges, you will be able to compare the water collected and to see whether these features influence the amount of rain reaching the ground. Measure and record daily or weekly amounts.

Wind

You may be able to see where the prevailing wind comes from (this is the direction the wind normally blows from), just by looking at any existing trees or shrubs which will tend to lean away from the main air stream. However, buildings, hedges, trees and the shape of the land may increase or decrease the power of air currents and can change or even reverse the direction of flow. The simplest way of finding out which way the wind is blowing is the wet finger technique: you go to the place in question and hold up a wet finger. The side that feels cold first is the side the wind is blowing from. Additional information about relative wind speeds can be obtained from a few simple wind gauges scattered around the site. Why not make some with your teacher? These may not tell you the absolute wind speed, but can give a good overall picture of where the wind is increased or blocked. Combining each wind speed gauge with a simple weather vane will also tell you how the direction of air flow varies from place to place

Soil texture

In general, soil particles range from the tiny ones that form clay to the large ones of gravel, with sand in between. Most soils consist of a mixture of different-sized particles, together with variable amounts of organic matter. A simple and accurate test for soil consistency is to shake a sample of soil in jar of water and allow it to settle. Gravel and stones will instantly fall to the bottom, the smaller grades will settle out on top of them in order of size. Organic material will tend to float on the surface.

Out in the garden we can also do a simple spot test. Take a small amount of damp soil in your hand (wet it if it's dry, but only to make it damp). If you can squeeze it into a single lump you have a clay soil. Sandy soil won't stick together at all. You may find you have soil that is somewhere in between these two. Test the soil in different places and at different depths. Record your investigations. These studies will tell you how good your soil is at holding water and will indicate which plants will be most comfortable there.

Soils with a high proportion of clay hold water and nutrients well but may become waterlogged in the winter and bake hard in the summer. They can also be slow to warm up in the spring. Very sandy soils on the other hand are well aerated (they've been exposed to the air) but can struggle to hold on to water or nutrients. Both can be improved by adding compost, or other organic matter such as leaf mould, to the soil.

Acid alkali balance

The level of acidity of the soil is critical to plant growth. It is measured on a scale from 1 to 14, known as the pH scale. The lower the pH (the nearer to one) the more acid the soil, with 7 indicating neutral. In general, the best pH for the garden is between 6 and 7.

Test your soil in as many different locations as you can and record the results on your maps. Once any variations are known, we can plan to use plants that suit the particular conditions.

Counting worms

Counting your earthworm population may tell you more about the health of your soil than anything else you can do, and it is almost the easiest of all. Sprinkle very slightly soapy water (1 part washing up liquid in 200 parts water) on to a measured area and count the worms as they pop out.

This process won't harm the worms. Healthy soil can yield over 100 worms per square yard. If you find fewer than a dozen per square yard there is either a serious shortage of organic material in your soil or something wrong with the pH.

Map-making

The basic map-making session may cover the following National Curriculum areas:

Measuring the boundary and distances

- Maths: Real life measurements, distances and calculations, Ma3: 1a, 4a, 4b; Ma4: 1c, 1d, 1e
- English: Group work and discussion En1: 2b, 2e, 3a

Drawing the plan

- Maths: Collecting information
- Ma2: 4a, 4b, 4c; Ma3: 1a, 1e, 4a, 4b; Ma4: 1c, 1d, 1e
- Geography: Using scale, drawing maps and plans
- Geography: 2a, 2b, 2c, 2e
- Information Communication Technology: Research, collecting and entering data to use a computer program for the plan
- ICT: 1b

Planning the garden layout

- Art and design: Exploring and developing ideas
- Art and design: 1a, 1c
- Maths: Real life measurements and distances
- Maths Ma2: 4a, 4b, 4c; Ma3: 1a, 1e, 4a, 4b; Ma4: 1c, 1d, 1e
- English: Research, reading and discussion
- English En1: 3a-f; En2: 3a-d

Further extension work

Visit – Children can visit other school gardens, local allotments, market or kitchen gardens. Make note of features they liked, plants they would like to grow etc. Use this knowledge to aid their own school designs. This could cover National Curriculum areas in English for written work, Art and Design for drawings, ICT if project involved digital photography and subsequent manipulation of pictures, Science for how plants grow and conditions they require, Geography and Maths if sketches with measurements were made.

- Building a Wind gauge or making an anemometer.
- Reading Thermometers
- Above or below average?
- Weather and English (poems about the weather)
- **Weather Experiments:** Make a tornado in a jar; Make a cloud in a glass; Weather fronts; Water cycle in a bag; Measuring a puddle

Resources: Many of these extension activities came from: *www.metoffice.com/education/primary/teachers*