**Power Plants**

**Aim:** To promote the value of plants and an understanding of their benefits to the environment, other plants, animals and humans by highlighting their beneficial qualities and characteristics, as well as their biology and cultural significance.

**Design your own garden**

Participants are asked to design their own garden by choosing plants and other features to place within it. They are able to choose 4 plants, out of the 7 possible plants and 2 other garden features from the 5 available. Once chosen, they can then stick them onto their garden template, wherever they want. We also have colouring pencils available if people want to colour theirs in, and add other things too it.

We want people to think about their plants carefully and consider a number of things. Which ones they know already, which they like the look of most etc, but also consider other things, like which are beneficial for humans directly, good for the environment, provide food for other animals or even help other plants. There is no right answer, more about getting people to realise that plants do more than just look pretty in our gardens. Each plant has a nickname based on what they do, and the information sheets have lots of relevant facts and details about the various characteristics of the plants, interesting facts, and ways of identifying them.

We also have a number of other features designed to encourage wildlife in the garden that we are getting people to choose from. The idea is that our gardens can help encourage biodiversity locally and protect and conserve our native species. The RSPBs ‘make a home for nature’ activity packs are a good source of information for these - <https://ww2.rspb.org.uk/makeahomeforwildlife/givenatureahomeinyourgarden/>

**The most popular plant**

It would be good to keep a tally of which plants people choose, so ask them to add their plants to our tally once they have made their garden, or offer to do it for them. We can then find out what the most popular power plant is.

Questions to ask (plus any other you can think of):

* What are your favourite plants generally, of the ones they can choose from / why?
* Why are plants important and beneficial for us and the environment?
* What do plants do?
* When we design our gardens, who should we design them for? Just us, or should we consider the wider benefits they might bring?
* How can we tell plants a part (link to ID guides on the sheets)? Why is this important?
* Why are some species of plants and animals threatened? How can we help?
* Which plants go well together (eg Borage and Tomato).

**Follow up**

* Tweet: Get them to take a photo of their Gardens using the #PowerPlants and @Society\_Biology
* Buy seeds and plants from their local garden shop. You can find where your nearest one is on the internet.
* Download all of the plant info sheets online.
* Sign up to receive a one off email about the Society of Biology, membership, who we are and what we do.
* Visit the RSPB website and download activity packs to find out how to give nature a home - <http://www.rspb.org.uk/>
* They can find out about gardening and other plants at the Royal Horticultural Society - <https://www.rhs.org.uk/>

More information

**The value of plants**

Here is a list of a number of ways that plants are valuable, encourage people to think of as many as they can. They can be split up into Supporting services, Provisioning, Regulating, and Cultural.

* **Food and drink** – for humans and animals, due to their ability to harness the energy of the sun through photosynthesis. Most of the global population rely on crops from just 30 plant species in their diet. However, many more species are important food sources - around 7,000 plant species have been used by humans for food - and fungi also play a vital role in food.
* **Medicines** – Over 80% of the global population rely on traditional medicine, much of which is based on plant remedies and many modern medicines are based on chemicals found in plants.
* **Beauty and Cosmetics** - Plants are a source of oils used as moisturisers in a variety of products.
* **Shelter** – Numerous species build their homes in plants, and humans have used plants for all manner of building materials.
* **Ecosystem Regulation** – improving air quality, controlling climate, improving soil quality and protecting against floods, absorbing greenhouse gasses.
* **They produce oxygen** so we can breathe!!!
* **Fibre and dyes** - Paper, ropes, cords and textiles are all made from plant fibres. These are elongated cells with very thick cell walls found in plant stems, leaves, bark and seeds.
* **Fuel** - plants are an important source of fuel for cooking, boiling water and keeping ourselves warm.
* **Culture / traditions and beliefs** - Humans have built close relationships with plants in the environment surrounding them and they bring a lot of pleasure to many people. Many strong traditions and beliefs regarding particular species have also developed over time. EG - The banyan tree (*Ficus benghalensis*), for example, is known in Hindu mythology as 'the wish-fulfilling tree' and is frequently planted around temples in India.

**Supporting.** Plants form the critical base of food chains in nearly all ecosystems. Through photosynthesis, plants harvest the energy of the sun, providing both food and habitat for other organisms. For example, plants are fed upon by insects, which may be eaten by birds, which are in turn are eaten by birds of prey, and so on. In general, native plants support other native species more effectively than non-native plants.

**Provisioning.** Many native plants can be harvested for food, animal feed, and fiber. For example, blueberries, cranberries and hazelnuts have traditionally been important foods for Native Americans and are commercially produced today. We also harvest native trees and shrubs for firewood, and to produce wood for building or pulp for paper products. Some people use native plants as medicines.

**Regulating.** Native plants also contribute to regulating ecosystem functions such as flood control and climate regulation. For example, diverse native plant communities along waterways and roadsides slow water movement and can prevent flooding much more effectively than mown turf. Also, during photosynthesis, plants absorb carbon dioxide from the atmosphere, release the oxygen for us to breathe and store the carbon in their roots and stems, helping to regulate greenhouse gases.

**Cultural.** Native plants are valuable to human cultures for recreational and spiritual uses. Historically, Native Americans used black ash to make baskets for both functional and ceremonial purposes. Today, many people especially appreciate a wooded park-like setting for camping, picnics and other family gatherings. Some make a special pilgrimage to their favourite woodlot each spring to see the wildflowers, or they grow particular native plants in their garden to support butterfly larvae or bees.

**Plants** (see info sheets for full details)

**Other Features to encourage wildlife**

**Wood Pile -** Use old, dead logs to create an inviting home and feeding ground for insects, toads, newts and bees. You won’t see much going on at first, as these creatures like to hide in the dark. If you turn one of the logs over in the day, you can watch plenty of creepy-crawlies scurrying away out of the light. At night, look for woodlice, snails and wood mice emerging from shady woodpiles. If you’ve made a log pile in the sun, look for solitary bees seeking nestholes.

**Bird Feeder –** Somewhere to provide food and shelter for birds. The modern approach to garden bird feeding is to use a range of foods that support the specific nutritional requirements of a wide range of species over the course of a year. There is scientific evidence highlighting the positive effects that the provision of supplementary food can have on birds. For example, the provision of supplementary food has been shown to improve overwinter survival in a number of species.

**Pond -** There’s something enchanting about sitting next to a garden pond, and it’s amazing how quickly wildlife will find it and create a thriving ecosystem. In summer, it should be only a short matter of weeks before pond skaters and water beetles arrive under cover of darkness. You might get dragonflies and damselflies in your first season. And frogs and newts are likely within a year.

Don't be put off by flushes of algae, which are either stringy or turn the water green or brown – that's normal in a new pond.

**Bug Hotel** - Offer solitary bees five-star accommodation with an easy-to-make hotel for these furry pollinators. Solitary bees aren’t like honeybees that live in hives. As their name suggests, they make their nests on their own and lay their eggs in tunnels, like in dead wood or hard soil. A bee hotel mimics these conditions. Sit and watch adult female bees find the nest on sunny days in spring. You’ll know they’re nesting if you see them flying in with pollen (some carry it on their bellies), with blobs of mud to create cell walls along the tube, or with bits of leaf (these are the leaf-cutter bees).

**Hedgehog Tunnel -** Hedgehogs need to travel through entire neighbourhoods if they are to survive. In fact, they can roam several kilometres in a single night to find enough food, safe nesting sites and potential mates. The more easily they can get around through our gardens, the better chance they have at a future.