

4. Our Own Wildflower Guide

Aim	After weeding, students sort and identify the weeds. Student teams create a wildflower guide and discuss the adaptations and success of 'weed' plants. The plant parts are used for making compost.
Recommended for	All students
Subject Links	Science: classification; Art: designing, Craft: creating plant pressing; IT
Horticultural Skills	Weeding, composting
Process Skills	Observing, classifying
Equipment/Materials	Digital camera. Optional: 'A Guide to the Wildflowers of Singapore', 'A Guide to Medicinal Plants' (Singapore Science Centre Guide Book).
Duration	1-2 gardening session/s (1-2 hours)
Preparation	Photocopy the handouts, book the computer room (web research)
Safety	Brief students on 'Garden Nasties' (see page 4). Look out for students who may be allergic to pollen in the air or plant sap. Warn students about plants which have thorns.

Procedure

1. Brief students on the safety issues (see page 4).
2. Distribute the handout, explain the activity and briefly run through the main points on the handout.
3. They need to photograph the weeds before weeding them as the plants will wilt after removal from the ground.
4. After weeding, get students to bring the plants to a designate a place for composting (a shady humid area is most suitable).
5. Students then go to the computer room, to download the pictures from their digital camera and identify the plants. Help them confirm the identification of the weeds, using a wildflower guide or online references. They carry out web research on the species found in the school garden and start creating their own wildflower guide for the school.
6. Debrief the activity.
7. They can post pictures of their 'wildflower guide' on your school blog or the NParks Gardening blog 'Young Gardeners' (http://www.nparks.gov.sg/blogs/young_gardeners/).
8. Extension: Convert good wildflower guides into a educational labels or booklets Students can use parts of their weeds for creating plant pressings (see Activity 3 Pruning Fun).

Debrief

§ Discuss the questions on their handout:

a) Why can weeds be considered successful plants?

They are so abundant everywhere, able to grow in the harsh conditions, where our ornamental plants may not survive and reproduce so quickly.



Activity 4

b) What adaptations do most 'weed' species have that enables them to be so successful?

- They have fast growth rates and short reproductive cycles.
- They are hardy plants, adapted to grow in places with minimal soil. These plants can tolerate high temperatures and low water conditions.
- They produce large numbers of seeds.
- They have very efficient methods of seed dispersal and their seeds are adapted for the agent of dispersal - e.g. the seeds of the Common Vernonia (*Vernonia cinerea*) are very small and have parachute structures which are dispersed by wind. Others have hooked seeds for dispersal by animals e.g. Love Grass (*Chrysopogon aciculatus*).

c) How can composting garden trimmings (cut plant parts from pruning and weeding etc.) help in solid waste management?

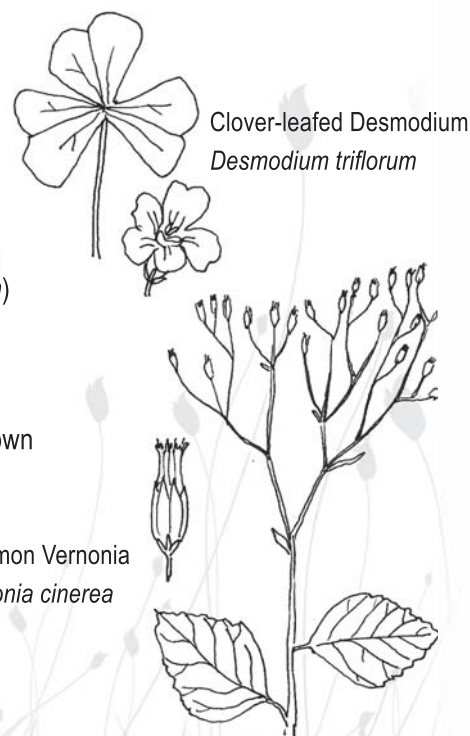
In Singapore, the amount of waste generated per day is very high – almost 1-1.2 kg per day per person. This is excluding the industrial and 'agricultural' waste. Taking biodegradable material like plant clippings out from the main load of garbage saves space in our landfill, prolonging the landfill's life. Moreover, these clippings can be composted to produce high-organic based compost, which is important for soil improvement. In a small scale, schools can also do their part in waste reduction by composting garden clippings and obtain a source of compost to enrich the soil in the school garden.

§ Commend teams with well-researched and designed Wildflower guides.

§ Ask the students to share with the class what have learnt from this activity. Alternatively, you could ask them to fill in the reflection sheet in Annex 3 and discuss their reflections.

Additional Information

- Identify the most common weeds found in your school. Common weeds include Common Vernonia (*Vernonia cinerea*), Hairy Spurge (*Euphorbia hirta*), Pick-a-back (*Phyllanthus niruri*), Yellow Wood Sorrel (*Oxalis corniculata*), etc.
- Some wildflowers have medicinal value e.g. Lesser Clover-leaved Desmodium (*Desmodium triflorum*) and Asian Pennywort (*Centella asiatica*).
- Wildflowers from the legume family e.g. Clover-leaved Desmodium (*Desmodium* sp.) are able to fix nitrogen in the soil in their root nodules. They are sometimes grown as ground cover to help prevent erosion.



Name : Members of your team :

4. Our Own Wildflower Guide

Project Objectives

Your Team has to:

- Identify the 'weeds' (wildflowers) in your school garden, photograph them and create a wildflower guide
- Discuss the adaptations and success of 'weed' plants
- Use the weeded plants to make compost (to help reduce the amount of waste sent to the incinerator and then landfill)

Duration of activity

1-2 gardening session/s (1-2 hours)

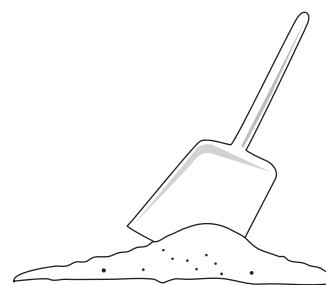
Suggested Steps

1. Go to your school garden and look for weeds/wildflowers. Take photographs before you start weeding (as they wilt after removing them from the ground).
2. After weeding, bring the plants to the designated composting area for composting (a shady humid area is most suitable).

FOR MAKING COMPOST

You need: Secateurs, a spade, trowel or changkul, garden soil, weed plants

1. Cut the weed plants into shorter pieces.
2. Using a trowel or spade, scatter soil from the garden (which contain soil bacteria) around the clippings and mix it up. Leave your compost pile.
3. Check on the compost pile once a week. The pile needs to be kept damp and turned (mix up bottom and top layers) once every 2-3 weeks, to improve aeration and hasten the composting process.
4. In 2-3 months, you can use the compost for plants in the school garden to improve soil condition.



3. Next go to the computer room and download your pictures. Identify them. You could refer to 'A Guide to the Wildflowers of Singapore' book for identification.
4. Do research to find out more about the wildflowers in your school garden (common name, scientific name, whether they have medicinal properties, fix nitrogen etc.). You could refer to 'A Guide to Medicinal Plants' (Singapore Science Centre Guide Book).
5. With the pictures and information, write and design a wildflower guide for your school.



Weeds are defined as 'unwanted plants'! In our gardens, they compete with our garden plants for nutrients, water, space and light. Weeds make our plant beds look untidy and some even spread diseases to our plants! From a biological view, their persistence and ever-presence indicate how successful they are. Perhaps we can give them a more indiscriminating name of 'wildflowers'. Look closely at them, and you will discover how lovely some of them are!

Equipment/Materials

- Digital camera
- Optional: 'A Guide to the Wildflowers of Singapore', 'A Guide to Medicinal Plants' (Singapore Science Centre Guide Book).

6. Discuss these questions about local wildflowers:

- a) Why can weeds be considered successful plants?

- b) What adaptations do most 'weed' species have that enables them to be so successful?

- c) How can composting garden trimmings (cut plant parts from pruning and weeding etc.) help in solid waste management?

7. You can post pictures of your wildflower guide on your school blog or the NParks Gardening blog 'Young Gardeners' (http://www.nparks.gov.sg/blogs/young_gardeners/).

Tips!

- When photographing, use your 'macro' mode on your camera to take close-up pictures of the wildflower/weeds.
- When weeding, pull out the entire plant, otherwise the remaining portion of the plant may regenerate into a new plant!

Extension

Convert your Wildflower Guides into educational labels for your school garden.