CURRICULUM CONNECTIONS

GRADE 3 MODULE

GRADE 3 MODULE

Introduction

The science curriculum in grade three offers opportunities to study plants – the area of soil in the environment and the area of growth and changes in plants. The focus for this unit on flowers and potted plants will incorporate the "big ideas" from the Growth and Changes in Plants unit, but reference will also be made to the study of plants as they relate to soils. This unit will examine the nature of plants and the importance of plants as sources of oxygen, food, and shelter, and the need for humans to protect plants and their habitats.

Curriculum Expectations

Students will:

- Observe and compare the parts of a variety of plants – root, stem, flower, stamen, pistil, leaf, seed – and how each contributes to the plant's survival;
- Germinate seeds and record similarities and differences as seedlings develop (e.g. plant quick-growing seeds – nasturtium, morning glory, sunflower, tomato – in peat pellets to observe growth:
- Describe how plants get energy from the sun;
- Assess ways in which plants have an impact on society and the environment;
- Demonstrate an understanding that plants grow and change and have distinct characteristics;
- Assess the impact of human activity on plants, and list personal actions they can engage in to minimize harmful effects and enhance good effects. For example, when humans provide common houseplants and blooming potted plants with an appropriate environment, they help fight pollution indoors and release oxygen;

LESSON #1

Parts of a Plant and Parts of a Flower

Lesson Overview

Students will observe plants – either hands-on with flower samples or with the diagrams and photos provided – and compare different flowers.

Curriculum Expectations

Students will:
Observe and compare the parts of a variety of plants – root, stem, flower, stamen, pistil, leaf, fruit, seed – and how each contributes to the plant's survival.

Background Information

Teaching the parts of a plant may be "new information" for some teachers. This summary will provide you with some basic information about the parts of a plant. You should use your professional judgment regarding the students in your class and the curriculum expectations as laid out by the Ministry of Education and your local school board to determine the level of detail that you wish to impart to your students. The parts of a plant and parts of a flower are illustrated in photos and diagrams and in four appendices to the grade 3 lesson plans. Use those photos and diagrams that you feel will best meet the needs of your students.

Appendix 3.1 **Parts of a Plant – and** Appendix 3.2**, the unlabeled version**
Appendix 3.3 **Parts of a Flower – and** Appendix 3.4**, the unlabeled version**

These appendices could also be used for assessment purposes.

LESSON #1

Parts of a Plant and Parts of a Flower

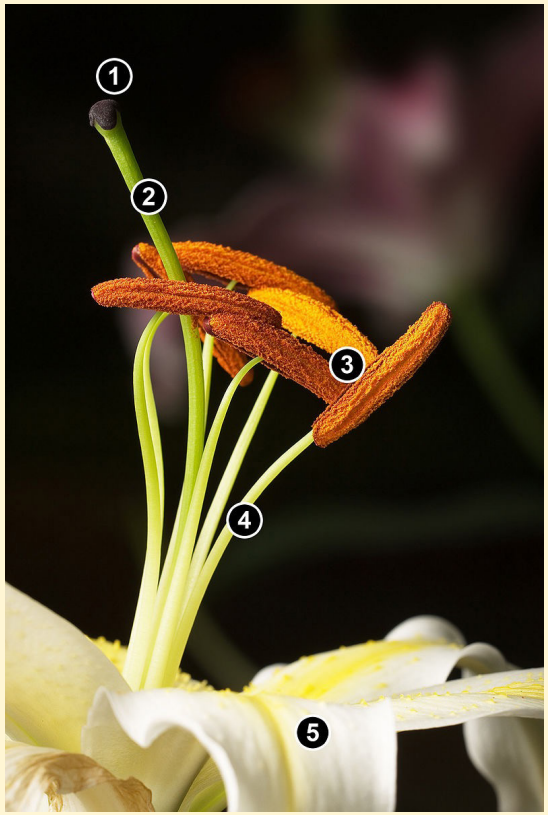
Figure 1 – Functions of Parts of a Flower or Plant

PLANT OR FLOWER PART	FUNCTION
Seed	Seeds vary greatly in size and structure. Seeds germinate using water; the seed coat ruptures and roots start to develop.
Root	Usually lies beneath the surface of the soil but can grow above the ground or above water. The root transports water to other parts of the plant.
Stem	The stem is above the surface of the ground. Stems support and elevate the leaves and flowers and are affected by light. The stem moves fluids from the roots to other parts of the plant and stores nutrients for the plant.
Leaf	Usually a thin flat organ, most often appearing above the ground. The upper and lower parts of a leaf may be different in colour and texture. They are very important for photosynthesis. Leaves can also store food and water.
Flower	The flower may also be called a bloom; Flowers are how most plants reproduce and, when fertilized, contains the seeds of the plant which cause the reproduction of the plant.
Stamen	The male organ of a plant that produces pollen – it usually consists of a stalk called the filament (which looks like a small stem) and an anther which contains the pollen
Pistil	The female reproductive part of a flower – consists of the ovary which contains unfertilized seeds or ovules, a tip called the stigma that is receptive to pollen and is often sticky, and a stalk or style which connects these two parts.
Sepal	Attached to the top of the stem, the sepal protects the flower in the “bud” stage and support the petals when the flower is in full bloom.

LESSON #1

Parts of a Plant and Parts of a Flower

Figure 2 – Parts of a flower



(Lilium longiflorum or Easter Lily)

Credit – JJ Harrison

1. Stigma
2. Style
3. Stamens
4. Filament
5. Petal

Figure 3 – Parts of a flowering plant

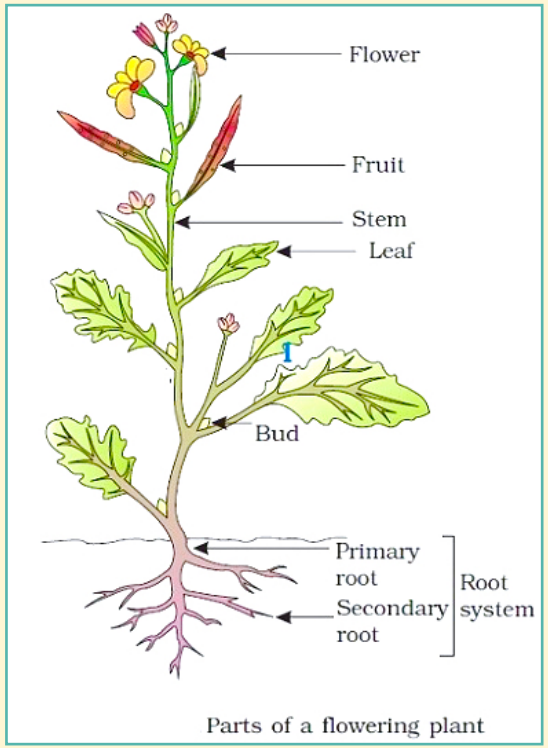
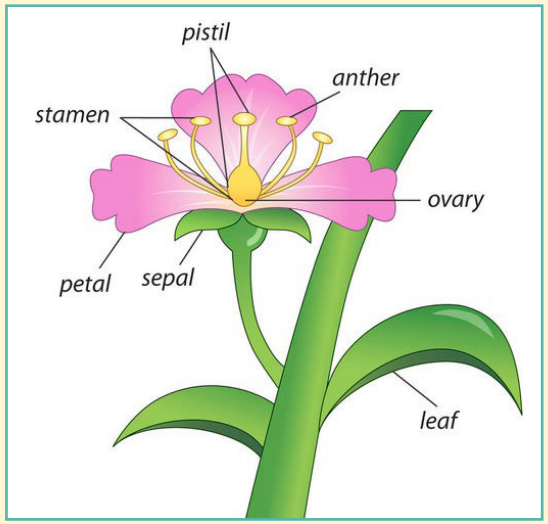


Figure 4 – Parts of a Plant and Parts of a flower



LESSON #1

Parts of a Plant and Parts of a Flower

How Greenhouses Work

Greenhouses create an artificial environment, sheltered from the ”outside” environment that may be too cold, too hot or too variable for the growing of plants. Greenhouses use their glass enclosures to trap solar radiation; the radiant heat enters through the glass or plastic covering and warms the air, soil and plants inside. This warm air rises and is replaced by cooler air that in turn is warmed up; this cycle raises the temperature quickly. The heat created by the solar radiation, plants and from the soil is “trapped” by the glass. Sometimes, the air inside can be overheated and has to be vented out. As you drive by a greenhouse, you may see the glass panels on top open to vent out the warm air vertically. Venting can also occur horizontally through side fans and vents. The venting also keeps the air in the greenhouse moving, allowing for a more even temperature throughout and cycling the carbon dioxide that plants need to grow. Most modern greenhouses have automated systems to regulate the temperatures inside.

The “heat” which is generated often comes from the sun. However, in really cold climates, heat is added to the air or to the soil.

In addition to the “heat component”, plants in greenhouses also require water. Many greenhouses use an automated irrigation system to keep the growing media moist and flowering plants supplied with needed water. Hydroponic systems, that don’t use soil to “hold” moisture, supply water directly to the roots on a more frequent basis.

Although a greenhouse may appear to be a simple structure, the key components of any human-made structure are present; in a greenhouse, these include :

- A strong foundation
- A sturdy frame to maintain the glass (or plastic) panels
- Flooring that varies from dirt to concrete, wood or stone
- “Glazing” - glass or other synthetic covering to allow in solar radiation and to help to provide insulation
- A system for watering of the plants and flowers

LESSON #1

Parts of a Plant and Parts of a Flower

Teacher Preparation

- Use Appendix 3.1 - the Diagram of Parts of a Plant and the unlabeled version (Appendix 3.2).
- For more detail of the flower parts, use Appendix 3.3 – Parts of a flower and the unlabeled version (Appendix 3.4).
- Photos and diagrams are also included showing the parts of a flower and parts of a plant (see Figures 2 and 3).

Lesson Plan

The approach to parts of a plant/flower can be done in a variety of ways.

1. If you have access to a greenhouse nearby, you might want to acquire several different plants/ flowers for the students to observe. Seeing, smelling, touching – these sensory experiences can be very important, especially for students living in an urban environment and ones who may have had little exposure to living plants. You might consider potted Chrysanthemums or mini-potted rose (available most of the year), Amaryllis (December), potted tulips, iris or hyacinth (February to May) or potted lillies (early spring).

2. Teachers may also wish to grow some flowers in the classroom; seeds are available from a variety of sources including hardware stores and some nurseries and seed companies. In the Niagara Peninsula, Stokes Seeds (Thorold) is a good source for seeds and for supplies, either on-line or at their retail facility, that will be of value in making the seed germination process a success.

3. If neither of the above methods are easily accessible for you, you can use the materials included with this lesson – diagrams of parts of a plant and flower, links to colour images of flowers and a simple chart indicating the functions of the parts of a flower. Models are also available from educational suppliers.

Assessment Suggestions

1. Use the colour photos of the flowers (Photos 3.1 – 3.6). You can use these with a digital projector, photocopy them for each of groups of students... whatever you wish. Have the students identify the parts of a flower that are visible in each of the photographs. Note that some of the parts will not be visible in all of the photographs.

2. Examine the photos. Identify the parts of a flower shown in each of the photos.

3. Use the blank copies of the parts of a plant and flower (Appendices 3.2 and 3.4) and have students label the parts.

4. Match the items in the following columns.

Seed	Supports the plant below ground
Leaf	Produces pollen
Root	Female part of the plant containing seeds
Pistil	Germinate using water
Flower	Supports the plant above ground
Stem	Store food and water
Stamen	Bloom

5. Have students bring in flowers from home or the neighbourhood; in groups, have them identify the parts of a plant and parts of a flower where visible. Share with another group to verify the responses.

LESSON #2

Growing Plants in your Classroom

Lesson Overview

Growing plants in the classroom can help students to appreciate the role that flowering plants can have on our lives by setting up a mini-garden in the classroom; obviously, this is probably most suited to a springtime activity, but it could be carried out at almost any season as long as the conditions in the classroom are favourable.

Background Information

Some of the suggested flower seeds that tend to grow quickly include nasturtium, morning glory and sunflower. However, others may also be used (possibly Wisconsin fast plant).

Curriculum Expectations

Through these experiences, students will:

- germinate seeds and record similarities and differences as seedlings develop (e.g., plant quick-growing seeds – nasturtium, morning glory, sunflower, tomato – in peat pellets or other media readily available in gardening stores - to observe growth);
- demonstrate an understanding that plants grow and change and have distinct characteristics;

Lesson Plan

Some suggestions for a small "garden" in the classroom:

- Use peat pots to plant the seeds; often, teachers use potting soil, but using peat pots to start the seeds will help to guarantee success for the students by optimizing moisture content and air availability. Once seeds are germinated it is beneficial to transfer the entire plant, in the peat pot, into a larger container containing soil. If you are not using peat pots, have containers with at least 8 cm of depth (3") to allow the roots to grow. Containers should have holes in the bottom to allow water to drain.
- Do NOT give each student a seed to grow; this exercise is more successful if groups of students are given a number of seeds (a larger number than the number of students in the group).
- Beside the window is NOT the best place to germinate seeds and grow small plants. Typically, seeds do not need light to initially germinate but should be moved somewhere bright once the seedling emerges. A general rule is to start the seeds somewhere warm but grow seedlings cool. Putting the seed trays on top of a water heater or refrigerator will keep the soil warm.
- Seeds need to be constantly moist to germinate. Moisten the soil before planting. After the planting, cover the container with plastic wrap to slow evaporation.
- Check on the seeds daily for signs of germination and remove the plastic wrap as soon as a sprout is visible.
- Make sure that your seeds/seedlings have enough light; lack of light will cause the seedlings to "stretch" to find light and become "spindly". 12 – 14 hours of light for growth and 8 hours of darkness to process their food. Seedlings will be pale and weak if they have not had enough light.
- Make sure that your seeds/seedlings have enough light; lack of light will cause the seedlings to "stretch" to find light and become "spindly". 12 – 14 hours of light for growth and 8 hours of darkness to process their food. Seedlings will be pale and weak if they have not had enough light.
- Consider using growing spheres for a few seeds to show students how roots develop (paperwhite narcissus bulbs are really good for this). Growing spheres are available from some educational suppliers, some florists and floral accessory stores, and even occasionally in "dollar" stores. As well as for this project, they have a myriad of other uses ... and, are re-useable.

LESSON #3

What Helps Plants to Grow?

Activity Overview

Photosynthesis is a complex process for grade three, but it can be made simple without compromising the science behind the process. Students will learn about the four elements that are necessary for plant growth and will experiment with one of these in terms of plant growth (lack of sunlight).

Curriculum Expectations

Although the Ministry of Education curriculum expectation for this area is fairly specific - describe how plants get energy from the sun – students will best understand the importance of the needs of plants by looking at all of the aspects of plants' needs. This can be easily accomplished using a comparison approach.

Background Information

Plants basically need four things to grow

- The sun (light, warmth, and for energy),
- Soil (base for the plants + nutrients + water),
- Air (particularly the carbon dioxide in the air for use in the process of Photosynthesis, but also the movement of air to transport pollen and seeds), and
- Water (rain, melting snow, irrigation).

A case could also be made for expanding the list to include time and space, but for grade three, it might be simpler to deal with just the four basic elements.

The Sun – plants need sunlight to grow; light is used as energy for making food for the plants (photosynthesis). If light is not provided in the proper amount, the plants will become weak and "spindly" and will have fewer flowers. The sun also affects the ability of the plant to grow; many plants prefer cooler temperatures at night and warmth during the day. Obviously, extremes of high or low temperature will have a negative effect on plants.

Soil – a healthy soil is extremely vital to plants – we often use "potting soil" to grow plants and, the potted roses that you purchase from a florist or greenhouse uses this as the basis for the roses' development. Soil provides nutrients for the plants – the nutrients are absorbed by the roots of the plant and move up the plant.

Air – Our Earth's atmosphere contains a mixture of gases – mostly nitrogen and oxygen, but also carbon dioxide and water vapour . Clean air is important for plants; pollutants can be harmful to plants and limit the plant's ability to take carbon dioxide out of the air for the process of photosynthesis.

Water – like humans and animals, plants also need water for survival. The water is a key element in the structure of the plant. Water carries nutrients from the soil to the other parts of the plant. If plants do not have enough water, they will not be able to carry the nutrients from the roots to other area of the plant.

Teacher Preparation and Materials

Photosynthesis is a complex process for grade three, but it can be made simple without compromising the science behind the process. Students will learn about the four elements that are necessary for plant growth and will experiment with one of these in terms of plant growth (lack of sunlight).

LESSON #3

What Helps Plants to Grow?

Lesson Plan

1. Ask students to list what their basic needs are for survival as humans. For example, you might ask them how long they could last without air (3 minutes … at the most! – but tell students NOT to try it) and then go on to water (3 days), food (4 – 6 weeks, assuming water is available).

2. Next, look at other things that might be required by humans like warmth/shelter, sleep, cellphone!

3. Then, look at plants using this little game with the students. Put a few students in an area about a square metre in the classroom using some cones or other markers to delineate the area.

Scatter multiple copies of four different coloured "cards" – just blank – in the area that the students are standing and ask them to pick up one of each colour.

Students are asked to pick up the cards without moving their feet – they are playing the role of a flower plant!

List the four elements that plants need on the board and ask students to suggest which colour matches the element.

If a student did NOT get a card from each colour, that plant would not survive.

4. Summarize the four elements and what each of the elements provides for plants. Note which parts of the plants are most important for the full "operation" of plant growth.

5. To illustrate the importance of sunlight for plants, a simple experiment can be conducted. Take some potted plants and cover one or two leaves on the potted plant with aluminum foil (attach the foil with paperclips). Ask the students to propose a hypothesis about what will happen to the plants and specifically to the leaves that are covered.

Leave the plants for a week in an area with lots of light and then compare the leaves. Students will write down their observations and re-examine the hypothesis to verify the results.

Review with students the importance of sunlight – a diagram could be used to show what has happened.

6. Review the term "photosynthesis".
The word "photosynthesis" is a long word for grade 3 students but it can be broken down into parts to make it more understandable … two parts – photo and synthesis. Photo means light. You can briefly explain how a camera takes a "photo" by opening a lens and allowing light to enter. Synthesis means combining into a whole. So, photosynthesis in this case is sunlight working to combine water (from the leaves) and carbon dioxide (from the air) into chemicals (carbohydrates) that promote plant growth.

7. Greenhouses are where many vegetables, flowering and potted plants are grown for our use.

How do greenhouses use the four elements for plant growth effectively to provide ideal conditions for plants to grow? Consider sunlight and how greenhouses make the best use of this light, water (and automatic watering systems within greenhouses), soil, and air (most greenhouses will have fans to move the air around and vents to get fresh air).

Lesson Extensions

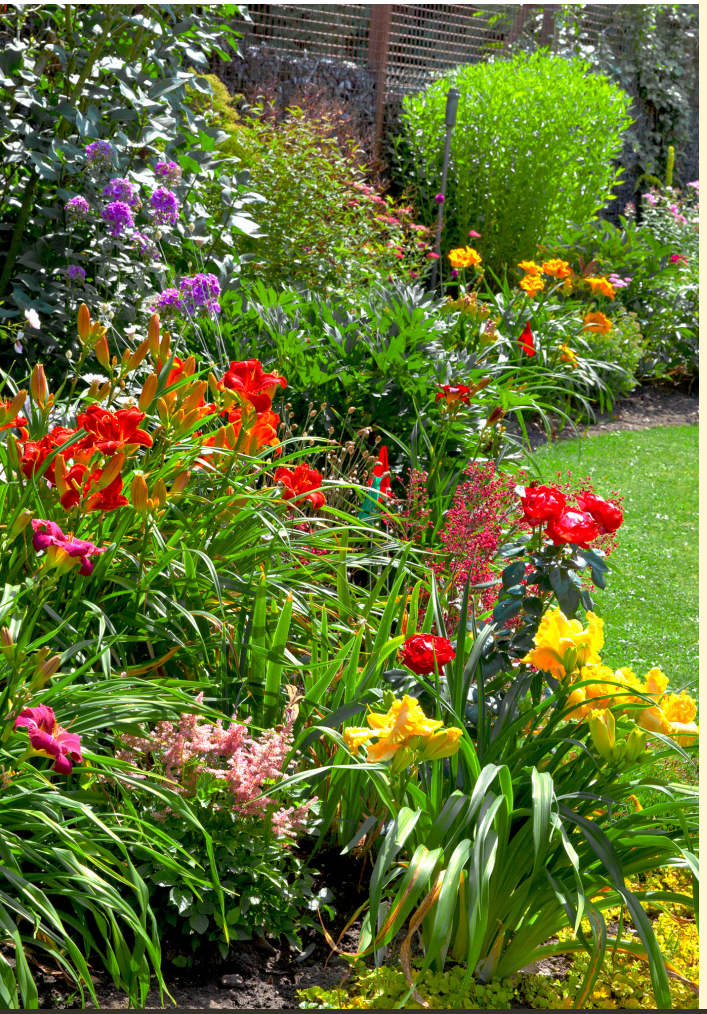
To emphasize the importance of the sun, not just for plants for everyday living, teachers can look at the importance of the sun for life on Earth and to review the importance of the process of photosynthesis and why it is important to life on Earth.

Assessment Suggestions

1. List the elements that are important to plant growth (4).
2. Explain how each of the elements is important to plant growth.
3. Suggest what would happen to a plant if each of the elements were not present; deal with each element separately (e.g. what would happen if there was no or little soil.)

LESSON #4

Plants, Society and the Environment



Activity Overview

This lesson is an opportunity for the teacher and students to reflect on the value of flowers and potted plants to everyone. Through discussion and the development of a diagram, students will begin to understand the implications of NOT having plants in our midst. In many ways, this lesson is to develop an attitude towards living things – in this case, flowers and potted plants – as important to how humans feel about themselves and about others based on sensory experiences. Flowers and potted plants can be a powerful influence on how people feel, behave and understand their role in the environment.

Curriculum Expectation

Students will:

- Assess ways in which plants have an impact on society and the environment.
- Assess the impact of human activities on plants, and list personal actions they can engage in to minimize harmful effects and enhance good effects. For example, when humans provide common houseplants and blooming potted plants with an appropriate environment, they help fight pollution indoors.

Background Information

Because of their beauty, plants are important to us as humans. When we build our homes (and other buildings such as offices), we also add trees, shrubs and flowers to enhance the environment. This is not a new phenomenon. For many years, flowers have been in close association with human life; this has recently strengthened. Over time, different types of flowers have become associated with different feelings (especially love) and emotions and decorations in the home. Poets and artists have also used flowers to enhance their works, either in words or on a canvas.

It is sometimes difficult to quantify the impact of plants on our daily lives; however, we intuitively know that plants are good for us. Studies have indicated that there are social, environmental and economic benefits from have more “green spaces” and more flowers and potted plants in both our indoor and outdoor environments. Indeed, studies have shown that increasing the number of plants and flowers can have remarkable benefits including:

- A reduction in vandalism and an increase in individuals’ self-esteem;
- Stress reduction;
- Health benefits such as lowering of blood pressure, and a reduction of feelings of fear and anger;
- A reduction of inattentiveness in classrooms;
- Reduction of Attention Deficit Disorder;
- Better communications skills from active gardening;
- Quicker recovery for patients (illustrated by a comparison of patients viewing

LESSON #4

Plants, Society and the Environment

Teacher Preparation and Materials

In advance of this lesson, ask students to do question #1.

For poems about flowers, teachers can use the website PoemHunter.com. Some of the poems will be too advanced for grade 3, but poems by William Blake (The Lily), Robert Service (The Flower Shop), and Robert Louis Stevenson (The Flowers) are suitable

In art, there are many images of flowers that can be shown to students in order to appreciate their beauty.

Examples include:

"Tulip" by Judith Leyster (1643)
"Blue Water Lillies" by Monet
"Oriental Poppies" by Georgia O'Keefe
"Lilacs in a Vase" by Manet
"Flowers" by Andy Warhol
"Bullfinch or Weeping Cherry" by Hokusai
"Vase with Pink Roses" by Van Gogh

Lesson Plan

1. Have students make a list of where they find flowers and potted plants over the course of a week (e.g. home, offices, civic gardens).
2. Now, assume that flowers and potted plants all of a sudden – DISAPPEAR.
3. Using a diagram develop a list of the implications of having all of the flowers and potted plants disappear. You might want to start using two of the basic senses – sight and smell – as a starting point for the diagram.
4. How would the lack of plants affect the air in an office building (you may have to review how plants "work", taking carbon dioxide out of the atmosphere)
5. Would our lives be better or worse if all of the flowers or potted plants suddenly disappeared? Why would this be the case?
6. Think about our houses and apartments. How do plants and flowers help the visual (sight) of houses and apartments? Why do people buy and plant flowers and potted plants in their gardens?

Suggestions for Lesson Extension

1. Research to find how poets and artists have used flowers in their works.
2. Show students images of flowers (see the photos in an earlier lesson plan, OR, use those famous images indicated above. Ask students which one they prefer and why. Ask them if any of the paintings make them feel differently – sad, happy.

Assessment Suggestions

1. Have students draw a painting of a favourite flower to be taken home.
2. Have students write a simple poem (3 – 6 lines) telling about flowers and how they make them feel.

LESSON #5

Building a Flower Garden

Lesson Overview

Building a flower garden will enable students to develop both knowledge and skills related to the needs and characteristics of living things.

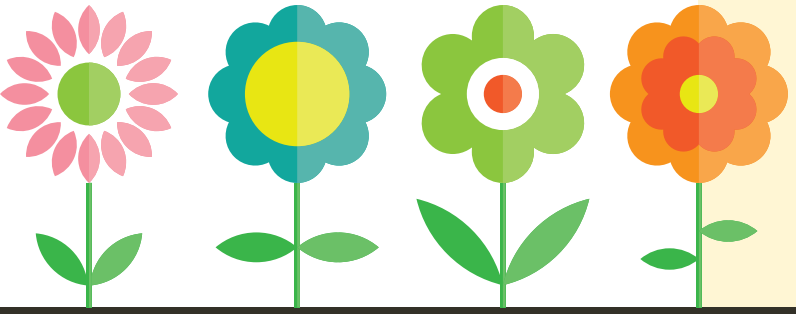
Building a flower garden will help students to learn about the value of these spaces, and the significance of pollinators such as birds, bees, butterflies, bats, beetles, and flies as well as other natural forces such as wind.

Curriculum Expectations

Students will :

- Identify personal action that they themselves can take to help maintain a healthy environment for living things, including humans;
- Describe changes or problems that could result from the loss of some kinds of living things that are part of everyday life (e.g., if we lost all the insects, all the bats, all the trees, all the grasses), taking different points of view into consideration;
- Identify the physical characteristics (e.g., size, shape, colour, common parts) of a variety of plants and animals (e.g., sunflowers are tall, with a long stalk, leaves, and big, round, yellow flowers with hundreds of seeds;

Describe how showing care and respect for all living things helps to maintain a healthy environment (e.g., leaving all living things in their natural environment; feeding birds during cold winter months; helping to plant and care for plants in the gardens that attract birds and butterflies; caring for the school and the school-yard as an environment).



Background Information

Building a flower garden on the school property – or as part of a garden at home – can be a very meaningful experience for students. There are many different organizations that can provide initial assistance in terms of actually building a sustainable flower garden. These include:

Canadian Gardening
canadiangardening.com

Gardening Know How
gardeningknowhow.com

Better Homes and Gardens
bhg.com

Flower Gardening Made Easy
flower-gardening-made-easy.com

LESSON #5

Building a Flower Garden

Teacher Preparation and Materials

Background information about types of flowers and the value of flowers will help students understand the importance of a flower garden, particularly in an urban setting. For the amateur home gardener, the rewards of growing flowers can be both recreational and emotional. Growing flowers is one of the most popular pastimes – from "urbanites" who grow flowers in window boxes to individuals growing house plants, to individuals or groups of people developing a garden in a vacant lot.

Flowers are considered as symbols of both grace and elegance; as well as being used for birthday and religious holiday presents and wedding adornment, flowers are used to cheer up people who are ill and are often used at funerals. What makes them so attractive in these many situations is their beauty and fragrance; consequently, people who grow flowers can benefit greatly from their results. Recent studies from Rutgers University have shown that flowers have a significantly larger effect on happiness than previously thought, suggesting that if you want to be happier, having flowers in your life is one possible way.

Gardens & Pollinator Health

Flowers are probably any garden's best friend! Not only do they add beauty and colour to a garden area or to a newly planted area, but they also play an important role in the overall health of plants.

The flower, of course, is the reproductive organ of a plant. Following pollination, it produces even more seed so that more of the same plant will grow in the future. The nectar and pollen produced by the flower is what is eaten by many insects – especially bees, but also birds and bats. A "pollinator-friendly" flower garden provides an opportunity for us to help to turn around the loss of pollinator habitats and promote the health and vitality of all manner of pollinators. A well-planted and maintained flower garden will attract beneficial insects including pollinators, but also ones that eat other harmful insects; for example, lacewings and ladybugs are helpful in reducing the number of aphids in a garden.

It is difficult to overestimate the importance of pollinators to our society. Not only do bees pollinate flowers, but they are also significant for our food supply. Although much of our grains are pollinated by the wind, it has been estimated that bees perform nearly 80% of all pollination on a global scale. A single bee colony may visit up to 250 000 flowers each day. They are also important for the pollination of vegetables, fruits and nuts.

In recent years there has been a decline in the number of bee colonies world wide, including in Canada. It is not yet evident what the exact cause of these pollinator problems is, however, it is likely a combination of several different factors including parasites, weather, disease, pesticides, in-adequate nutrition and a loss of habitat. It is with the problem of declining habitats that you too can help. With increasing urbanization, parks and backyard gardens often become the sole source of food for pollinators in urban areas. A small pollinator garden in every back yard would go a long way towards restoring pollinator populations across the province.

In summary, then, the development of a flower garden may be of real significance to the restoration of bee colonies in the area. In a small way, a flower garden could be an individual's contribution to the continuance of a vibrant agricultural economy in this province. A garden of diverse flowers will provide the bees with a habitat that provides both pollen and nectar to feed the bees themselves and the hives in which they live. For an easy to use guide to pollinator friendly flowers, please visit http://www.flowerscanadagrowers.com/pollinator-poster

LESSON #5

Building a Flower Garden

Where to Plant?

Flower gardens can be planted at the school, at home, or in association with local community gardens. One of the problems associated with school gardens is proper care during the hot (and often dry) summer months.

When to Plant?

Plan, Plan, Plan …
Teachers are encouraged to research the growing of flowers and identify what is needed. This is especially important when developing a flower garden for the first time. The websites identified in this section are particularly helpful in terms of providing guidance for the actual development of the garden site. Although not overly complicated, the emphasis still remains on the need to plan for the garden well in advance.

Most sites recommend beginning the development of a flower garden in the late summer or early fall for planting the following spring. This lends itself well for the school year – "build" the garden site in the fall and plant the flower gardens in the spring of the same school year.

What to Plant?

Some of the best flowers for both beauty and usefulness include marigolds, nasturtium, chamomile, morning glory, sunflower and Wisconsin fast plant. A full list of pollinator friendly flowers, as well as helpful tips, is available at http://www.flowerscanadagrowers.com/pollinator-poster.

How to Plant?

When the garden has been established, seeds should be sprinkled loosely on top of the soil, watered lightly and covered with a shallow covering of soil using either hands or a small rake. Try and keep the soil loose (not compacted down) as this will allow excess water to drain away after some has been absorbed by the seed. Seeds need water to germinate! This is the critical element for a garden. Too much water will encourage the growth of mould and fungus and can also "drown" the roots of the plant.

How to tell if seeds need water is the most difficult part of the growing process … but it can be quite simple. Poking a hole about 2 – 3 cm deep should indicate the amount of water in the soil. If the soil at the bottom is dry, it needs more water.

LESSON #5

Building a Flower Garden

The Size of the Garden

The preparation for this "lesson" and the materials required will vary tremendously with the commitment to develop a flower garden either for the school or for a home setting. Size, of course, will be a major consideration as the garden could be anywhere from a "mini-garden" made up of several flower pots to a large plot. If the flower garden is to be in a home setting, an area of 1 metre x 1 metre might be a good size for the students. It can, of course, be attached to a vegetable garden and can be beneficial for vegetables in that the flowers will attract pollinators.

On average, honey bees can travel up to 8 km to find food. If we build more gardens in our communities, the more bees will be fed. Several factors can affect the health of honey bees including:

- the weather (long cold winters)
- parasites (the varroa mite)
- viruses
- pesticides
- INADEQUATE NUTRITION
- Monoculture food sources (food diversity is important for pollinators)
- Loss of Habitat

By planting a diverse flower garden, individuals can help to keep the bee population of Canada healthy; this, in turn, has tremendous advantages for agriculture.
A new diverse flower garden can have a tremendous influence on the way students perceive their local environment, and may help students to understand the significance of flowers and the "creatures" that pollinate our flower gardens.

Where can I get help?

There are many different organizations that can provide initial assistance in terms of actually building a sustainable flower garden. These include:

Canadian Gardening	**canadiangardening.com**
Gardening Know How	**gardeningknowhow.com**
Better Homes and Gardens	**bhg.com**
Flower Gardening Made Easy	**flower-gardening-made-easy.com**
Bees Matter	**beesmatter.ca**