

Growing through the Seasons



Specific Learning Outcomes

- 3-1-01:** Use appropriate vocabulary related of their investigations of growth and changes in plants.
- 3-1-05:** Recognize that a plant uses the Sun's energy to make its own food.
- 3-1-07:** Identify the basic parts of plants and describe their functions.
- 3-1-08:** Explain how different adaptations of plants help them survive in particular environments.
- 3-1-11:** Identify characteristics that remain constant and those that change throughout the life cycle of a flowering plant.

General Learning Outcomes

- 3-0-1a:** Ask questions that lead to investigations of living things, objects, and events in the local environment.
- 3-0-4e:** Respond respectfully to the ideas and actions of others, and recognize their ideas and contributions.
- 3-0-4g:** Verbalize questions, ideas, and intentions during classroom-learning experiences.
- 3-0-5a:** Make observations that are relevant to a specific question.
- 3-0-9b:** Express enjoyment when sharing and discussing science-related experiences from daily life.

Vocabulary

wetland, plant, lifecycle, structure, appearance, characteristics, root, stem, leaf, flower, fruit, seed, Narrow-leaved Cattail, Wood's Rose

Summary

Students are introduced to wetlands by exploring the life cycle of a flowering wetland plant and identifying characteristics that remain constant and characteristics that change.

Materials

- Print 1 'Growing through the Seasons' circle for each student double-sided OR create large versions of the activity sheet on easel pads so students can work in groups
- Gather enough drawing supplies for each student or table group
- Print picture (included) or set up projection of the accompanying images
- Print and cut out cards (provided)

Procedure

Warm Up

Begin by asking students to list or describe the different parts of a plant. Project or show accompanying page identifying the parts of a plant (Daisy example), relating each part to humans when possible (stem is like a backbone, roots are like our still feet, leaves are like our hands when we make food, seeds are like babies).

Explain that roots keep the plant in place and collect nutrients from the surrounding soil or water. The stem keeps the plant upright and delivers the nutrients to the different parts of the plant. The leaves are where the plant makes its own food (using Chlorophyll) by absorbing the Sun's energy through a process called Photosynthesis. The flower is typically where the seed develops, and the seeds may be found inside of a fruit. The seed is a way for the plant to spread to other places. Note that these are the typical parts of a plant, but there can be exceptions.

A wetland is an area of land that holds shallow water, with a maximum depth of two metres. The water makes the soil very moist, so plants who need moist soils will grow in and around the water; this is why a wetland can not be deeper then two metres, because otherwise these kinds of plants drown and do not receive enough sunlight. The water moves slowly across because there are so many plants that slow the water down, absorbing some of the water like a sponge and filtering it as it moves through.

Each plant will be adapted to wherever it lives, from how it stays upright to how it overwinters.

The Activity

Explain that as a class you will be learning more about a particular plant that needs wetlands, exploring what this plant does during each season. Have students first identify what season it is currently, followed by listing all four seasons. Ask how the seasons may affect plants, and brainstorm together what ways plants change and/or stay the same during each season in order to survive.

Use either the Narrow-leaved Cattail or the Wood's Rose as the focus for this activity. Explain that you will be playing a game where the students will be trying to match the season with the correct stage of each plant's growth. Give each student a card (provided), and allow them to move around the class, looking at each other's cards, deciding if they match or not. If they think they match (such as one student has the "spring" card, and the other has the "stem sprouting from roots" card), they should stick together and find others that match their cards. Once the students are finished deciding, you should see four groups made (one group per season).

Show students the chart (provided), asking students if the groups they made match the groups on the chart. Ask students to describe what is happening in each picture, explaining the general changes and constants that occur for this plant throughout the seasons.

Wrap Up

Hand out the activity sheet to each student (the Venn Diagram and the explanation pages) **OR** create large versions of the 'Growing through the Seasons' circle on easel pads so students can work together in groups.

Have students draw the plant in each season showing the plant's changes and constants throughout its life cycle, writing a brief description on the back of the page about what is happening in each season.

Optional: Facilitate a brief class discussion on how the plant is adapted to the seasons, referencing the students' drawings and descriptions.

Conclude by explaining that as a class you will be visiting a wetland called Oak Hammock Marsh where students will be exposed to different living things that are found in a wetland, including plants like the Wood's Rose, and the Narrow-leaved Cattail.

Growing through the Seasons

-Teacher's Key -

Narrow-leaved Cattail:

The Narrow-leaved Cattail is a type of plant which is rooted in wetland soils but has its upper stem and leaves grow outside of the water (called an emergent plant). Cattails are common throughout the prairie provinces of Canada, found in marshes, ditches, ponds and on the edges of lakes. The Narrow-leaved Cattail has ribbon-like leaves, with the stem leading up to the flower which looks like a hotdog on a stick.

Cattails are very important plants in wetlands. They act like a sponge by absorbing water, which contributes to a wetland's ability to hold excess water after heavy precipitation, helping to reduce flooding. Cattails also act like a filter, absorbing nutrients (such as phosphorous), as the water slowly flows through the wetland. Finally, cattails provide shelter and food for a large variety of animals. Humans can even eat cattails. The stem (at the right time of year) is highly nutritious, and the pollen can be used as a flour substitute.

Spring: In the spring, stem begins to grow, leaves and the 'hotdog on a stick' develops. The 'hotdog on a stick' is the Cattail's flowers, starting off green, with the stamens (male flowers) pollinating the green "hotdog" (female flower) with bright yellow pollen.

Summer: Rich with green leaves, the "hotdog on a stick" or female flower becomes brown which is where the seeds are developing, and the male flower falls off.

Fall: In the fall, the female flower ('hotdog') is now covered with developed seeds, which will soften until the seeds "explode" (like a Dandelion) drifting away in the wind; this is how Cattails spread their seeds, finding other places to grow.

As the temperature gets colder, the Cattail's leaves and stem begin to turn light brown, eventually dying, as the cold reduces the plant's ability to make food through photosynthesis. However, the plant stores energy in its roots which allows it to survive the winter.

Winter: The cattail survives on the energy stored in its roots (in the form of starch) during the winter season.



Foliage has died off, and plant stores energy in roots.



Stem sprouting from roots.



Fully developed pollinated female flower, with shrinking male flower.



Female flower has softened and seeds have 'exploded'.



Male flower developing pollen, leaves developing.

Summer

Cattail seeds,
which are the
fruit of the
plant, spread
in the wind.

Spring



Fall

Winter

Spring



1

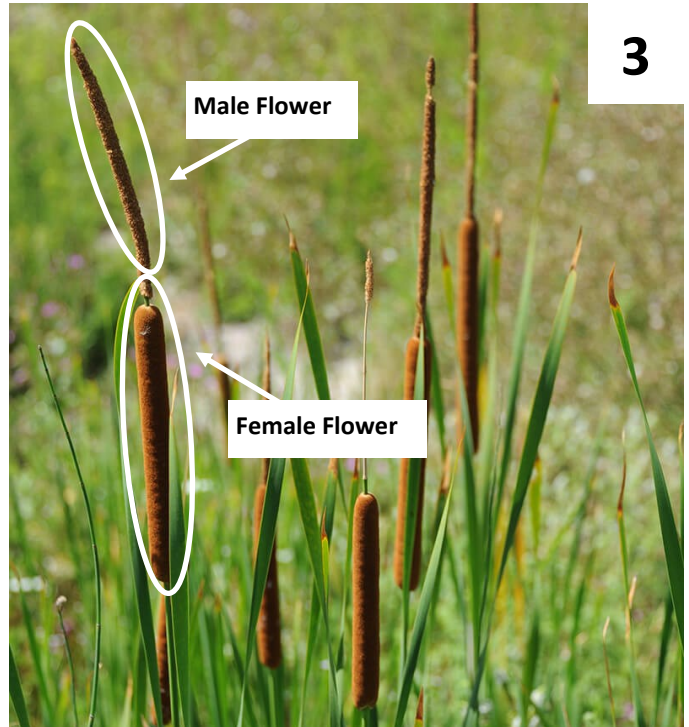
1. Stem sprouting from roots.

2. Male flower developing pollen, leaves developing (late spring).



2

Summer



3

3. Fully developed pollinated female flower, with shrinking male flower (early summer).



4

4. Female flower has softened and seeds have 'exploded'.

5. Cattail seeds, which are the fruit of the plant, spread in the wind.



5

Fall



6

Winter

6. Foliage has died off, and plant stores energy in roots.

Growing through the Seasons

-Teacher's Key -

Wood's Rose:

The Wood's Rose is a type of wild rose shrub found in a variety of ecosystems, including near the edges of water in a wetland. The Wood's Rose has a typical structure of a plant, having roots, stem, leaves, and developing a flower and fruit (where the seeds are located).

The Rosehip berry is a red berry filled with hairy seeds. Although edible and full of vitamin C (more than an orange), these berries cannot be eaten from the branch without the proper removal of the seeds, otherwise the seeds stick to the insides of one's intestines (due to the little hairs) and cause an uncomfortable experience referred to as "itchy bum." Animals, such as squirrels, birds, and coyotes, eat the Rosehip berries as they are a great source of nutrients in the winter when food is not as readily available; this is a way seeds are spread to new areas.

Spring: In the spring, once temperatures are warmer, the plant once again produced chlorophyll through photosynthesis, resulting in the leaves beginning to develop. The Wood's Rose fragrant pink flowers bloom typically in June, producing a bright yellow pollen.

Summer: The rose blooms typically last through the beginning of summer. The blooms will wilt, and the berry will begin to develop in late summer.

Fall: In the fall, the Rosehip berry will have become ripe red fruit, filled with seeds. As the temperature gets colder, the Wood's Rose leaves and stem begin to turn brown, eventually dying, for the cold reduces the plant's ability to make food through the photosynthesis process. However, the plant stores energy in its roots which allows it to survive the winter.

Winter: The Wood's Rose survives on the energy stored in its roots during the winter season, while feeding animals with its Rosehip berries, simultaneously spreading its seed to different locations where a new Wood's Rose plant may grow in the Spring.



Blooming
Wood's Rose
plant.



Ripe Rosehip
berries.



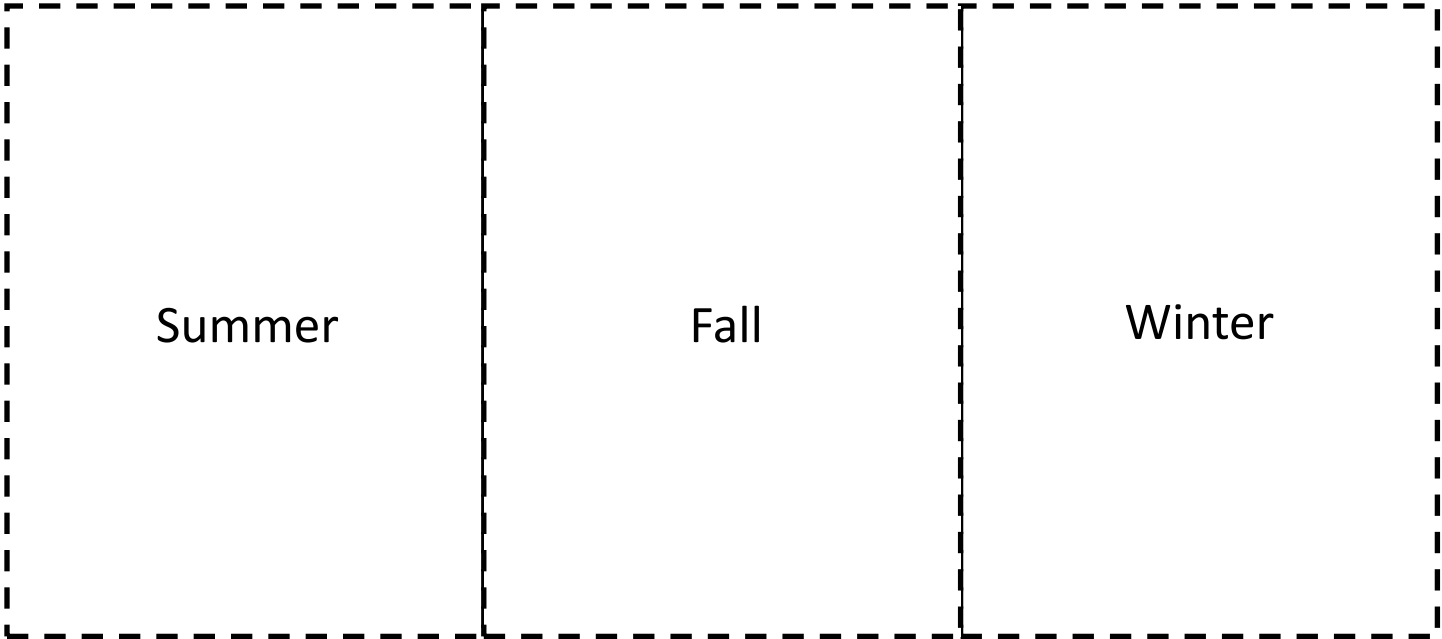
Leaves beginning
to lose their
chlorophyll —the
green substance
that makes leaves
appear green.



Rosehip berries
are all that
remain; foliage
has died off,
roots are storing
energy.

Spring

Image 1 by Clinton Shock from iss.oregonstate.edu. Image 2 from paulbardenroses.com. Image 3 from Wikimedia Commons. Image 4 from Pixabay.com



Spring



1. Blooming Wood's Rose plant (late Spring).

2. Close up of roses (flowers).



Summer



3. Ripe Rosehip berries (late Summer).

4. Close up of berries.



5. Leaves beginning to lose their chlorophyll — the green substance that makes leaves appear green.

Fall



6. Rosehip berries are all that remain; foliage has died off, roots are storing energy.

Winter



OAK HAMMOCK MARSH
INTERPRETIVE CENTRE

Growing through the Seasons

Spring

Summer

Winter

Fall



Conserving
Canada's
Wetlands



Manitoba



Growing through the Seasons

Name: _____

Plant's Name: _____

Write a brief explanation of what you have drawn, explaining what is changing in the plant's life cycle in each season, and what is staying the same.

Spring:

What changes?

What stays the same?

Summer:

What changes?

What stays the same?

Fall:

What changes?

What stays the same?

Winter:

What changes?

What stays the same?

