Roots, Shoots & Stems

Image from pinimg.com.

Specific Learning Outcomes

3-1-01: Use appropriate vocabulary related of their investigations of growth and changes in plants.
3-1-02: Observe, compare, and contrast the structure and appearance of several types of 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.

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, habitat, plant, soil, water, structure, appearance, root, stem, leaves, flower, fruit, Cattail, Wood's Rose, Common Bladderwort

Summary

Students are introduced to wetlands by observing, comparing and contrasting the structure and appearance of three wetland plants.

Materials

- *Print or project the plant images*
- *Drawing and colouring utensils for students*
- *Paper for each student*

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 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. Each plant will be adapted to wherever it lives.

The Activity

Explain that plants are found all over the world, and come in many varieties. Today the class will be exploring three kinds of plants that all live in a place called a wetland. A wetland is... (see note below). Wetlands covers almost half of Manitoba (41%), and are home to many different kinds of plants and animals.

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.

Explain that the class will be observing, comparing and contrasting the structure and appearance of three wetland plants: the Wood's Rose, the Narrow-leaved Cattail, and the Common Bladderwort.

The students will first be given their drawing materials, and then shown pictures of one of the plants (presenting the included page without labels). Students will then draw the appearance and structure of the plant, labelling where they think the different parts of the plant are located. Afterwards, go through the list of plant parts with the students, asking them where they think that particular part is found on that plant. Finally, show the labelled pictures of that plant, explaining its particular structure, and providing more background information. Go through this process for each of the other two plants.

Recommended: *It is highly recommended to start with the Wood's Rose because its structure and appearance may be the most familiar to students of the three plant options. Follow with the Cattail, then conclude with the Bladderwort, for its structure and appearance is not typical and students will not likely be familiar with this plant.*

Optional: *To better illustrate the Common Bladderwort's underwater trap you may wish to play one or both of these videos:*

The ultra-fast trap of an aquatic carnivorous plant by Philippe Marmottant. https://www.youtube.com/watch?v=Zb_SLZFsMyQ

Hungry carnivorous plants by Philippe Marmottant. https://www.youtube.com/watch?v=yKD0MyE3HVA

Wrap Up

Wrap up the activity by facilitating a class discussion comparing and contrasting the three wetland plants and discussing how each has adapted to the moist soil conditions of a wetland.

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, the Narrow-leaved Cattail, and the Common Bladderwort.

Wetland

Wetland

OAK HAMMOCK MARSH INTERPRETIVE CENTRE

Parts of a Plant

Flower

Where Seed (fruit) develops

Leaf

Flower Bud

Stem

Roots

Seeds (fruit)

Flower image from Wikimedia Commons. Seed image from Ebay.

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Manitoba

-Teacher's Key -

Roots, Shoots & Stems

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 Wood's Rose fragrant pink flowers bloom in June, followed by its fruit (the Rosehip berry) developing near the end of August and staying ripe throughout winter.

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.

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. They are found in marshes, ditches, ponds and on the edges of lakes. The Narrow-leaved Cattail has ribbon-like leaves, and a stem leading up to the flower which looks like a hotdog on a stick. In the spring, this 'hotdog on a stick' starts off green, with the stamens (male flowers) pollinating the green "hotdog" (female flower) with bright yellow pollen. In the summer, the seeds begin to develop in the female flower. In the fall, the female flower ('hotdog') has developed seeds, and will soften until the seeds "explode" (like a Dandelion) drifting away in the wind.

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.

Common Bladderwort:

The Common Bladderwort is a type of carnivorous floating plant found in wetlands, lakes, and slow moving streams in the prairie provinces. The Bladderwort has no traditional root system but rather the plant's floating stems are stuck in the moist soil to keep it from drifting. The plant has fine, thin leaves which are submerged, and bright yellow snapdragon-like flowers which grow above water. Small 'bladders' or tiny bags grow from the leaves which are able to capture prey. These bladders have fine hairs that are sensitive to touch. When activated the bladder will open, sucking in the small water bug with a vacuum effect, then shutting, digesting the prey with the digestive acids held within the bladder. The Common Bladderwort is the fastest known underwater trap in the natural world.

Wood's Rose

Large Wood's Rose image from Clinton Shock, Oregon State University. Small Wood's Rose image from paulbardenroses.com. Rosehip berry image from Pixabay. Rosehip seeds image from curiouskai.blogspot.ca. Root image from dendroboard.com.

OAK HAMMOCK MARSH INTERPRETIVE CENTRE

Wood's Rose

Fruit
(called Rosehip)

Seed

Root
(hidden underground)

Large Wood's Rose image from Clinton Shock, Oregon State University. Small Wood's Rose image from paulbordenroses.com. Rosehip berry image from Pixaboy. Rosehip seeds image from curiouskai.blogspot.ca. Root image from dendroboard.com.

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Narrow-leaved Cattail

Cattail plant image from animals.sandiegozoo.org. Cattail root image from askaprepper.com. Seeded cattail image from Wikimedia Commons.

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OAK HAMMOCK MARSH INTERPRETIVE CENTRE

Narrow-leaved Cattail

Male Flower

Leaves

Where the seed (fruit) develops

Female Flower

Seeds

Stem

Root

Cattail plant image from animals.sandiegozoo.org. Cattail root image from askaprepper.com. Seeded cattail image from Wikimedia Commons.

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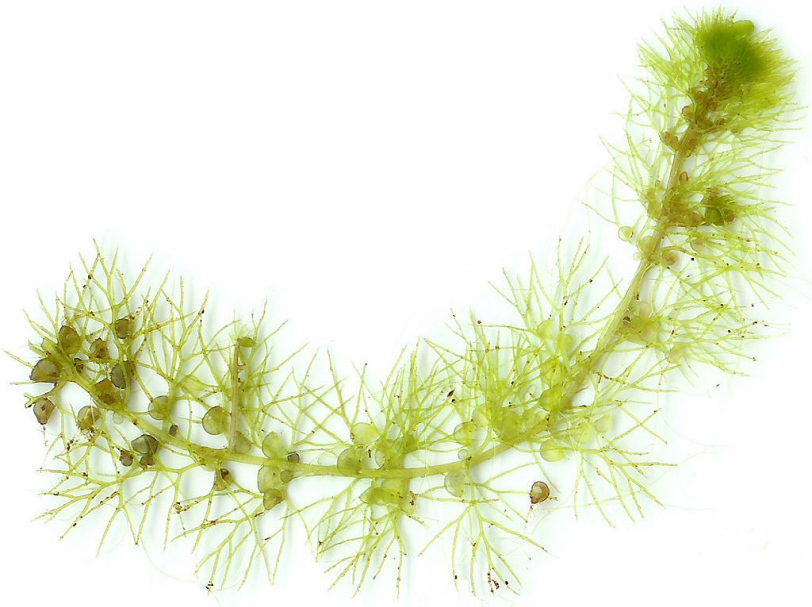
OAK HAMMOCK MARSH INTERPRETIVE CENTRE

Common Bladderwort



Flower image from pbase.com. Bladderwort plant and leaves images from Wikimedia Commons.

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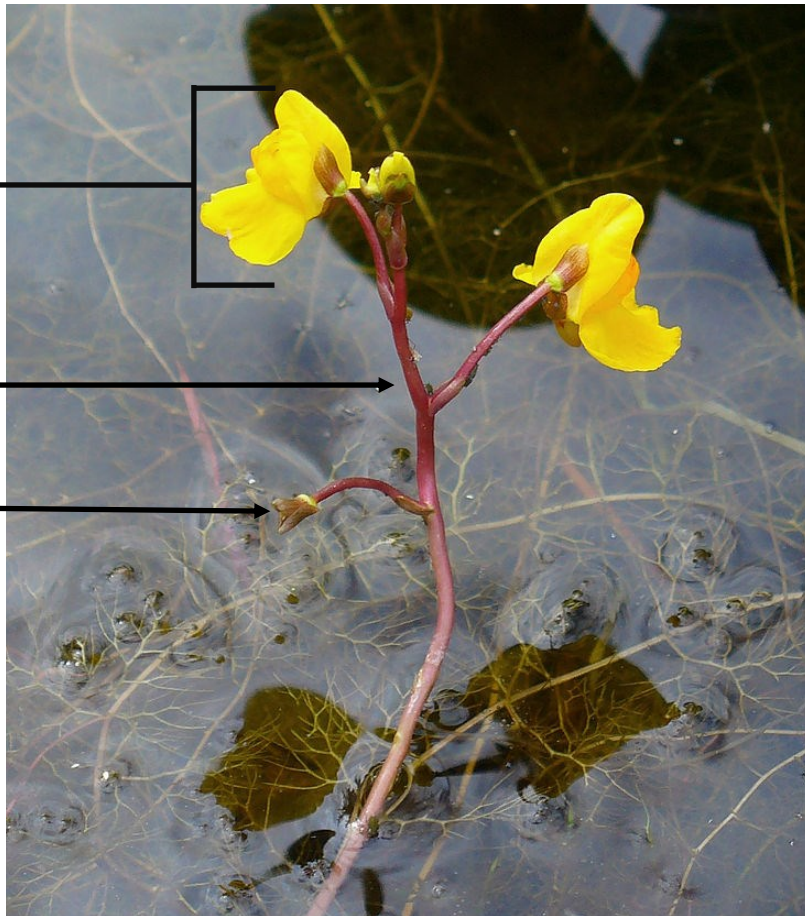
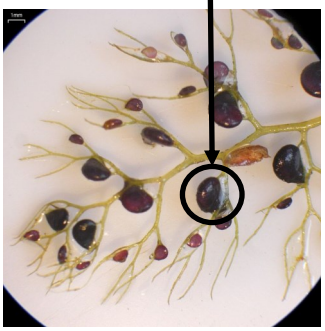
Common Bladderwort



Bladders (full, eating)

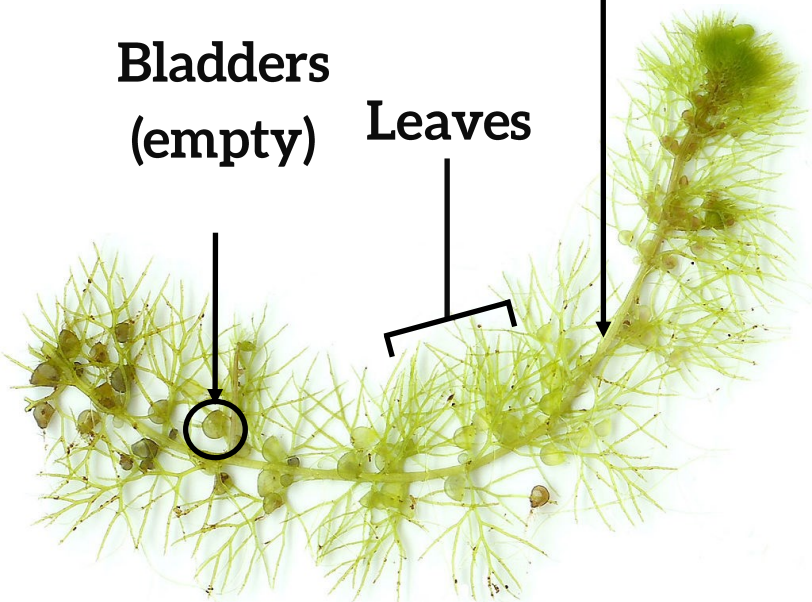


Where the seed (fruit) develops

Stem

Bladders (empty)

Leaves



** Does not have a root system, only a floating stem*

Flower image from pbase.com. Bladderwort plant and leaves images from Wikimedia Commons.