



United Nations
Educational, Scientific and
Cultural Organization



**MOUNT
ARROWSMITH**
BIOSPHERE REGION

BIOSPHERE BOOKLETS

Lesson Plans & Activities

BOTANY

SUMMARY/OVERVIEW

Grades:
1-2

Prep Time:
30 mins

**Learning
Environment:**
Indoor/Outdoor

**Total Lesson
Length:**
2 Hours

DESCRIPTION:

This booklet reviews the topics of botany and plant species, then introduces the concept of native plant species and First Nations usage of plants around Vancouver Island. This booklet discusses the importance of preserving native plant species. After a series of discussions, students will complete a scavenger hunt to apply knowledge in an outdoor setting.

CURRICULUM EXPECTATIONS:

Processing and analyzing data and information:

- Experience and interpret the local environment
- Identify simple patterns and connections
- Recognize First Peoples stories (including oral and written narratives), songs, and art, as ways to share knowledge

Evaluating:

- Compare observations with those of others
- Consider some environmental consequences of their actions

Planning and Conducting

- Make and record observations

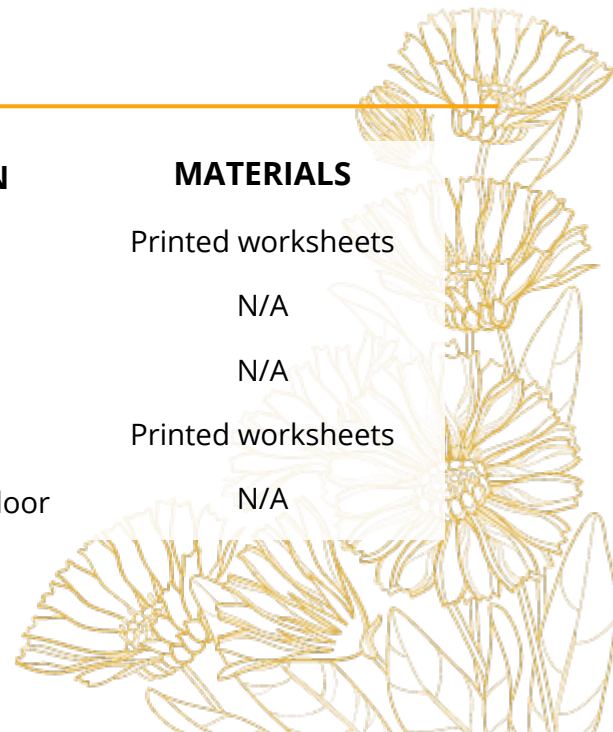
BACKGROUND:

Botany, (the study of plants) is essential to the knowledge of environmentalism.

Understanding the importance of native plant species, along with traditional First Nations usage of native plant species serves as a basis for preservation. Native plant species hold a plethora of benefits to their surrounding area.

LESSON PLAN

| TIME | ACTIVITY | LOCATION | MATERIALS |
|---------|-------------------------------|-------------------|--------------------|
| 30 mins | 1. Introduction to Botany | Indoor | Printed worksheets |
| 10 mins | 2. Native Plant Species | Indoor | N/A |
| 10 mins | 3. Traditional Uses of Plants | Indoor | N/A |
| 1 hour | 4. Plant ID Walk | Outdoor | Printed worksheets |
| 10 mins | 5. Conclusion | Indoor or outdoor | N/A |



| TIME | ACTIVITY | LOCATION | MATERIALS |
|---------|---------------------------|----------|--------------------|
| 30 mins | 1. Introduction to Botany | Indoor | Printed worksheets |

Introduction to Botany

GOAL: Review botanical terms and information on plant life.

PREPARATION: Print worksheets (page 3 and 4).

LESSON PLAN:

INTRODUCTION: Initial Discussion

1. Ask students what they know about plants and plant life.
2. Explain the term "botany".

Botany is the part of biology that deals with the study of plants, including their structure, qualities, and biochemical processes (ex. photosynthesis).

3. Ask students why they think plant life is so important? What impact does it have on our lives? Positive or Negative?
4. Explain the importance of plant life:

Plants are really important for the planet and **for all living things**. Plants absorb carbon dioxide and release oxygen from their leaves, which humans and other animals need to breathe. **Living things need plants to live** - they eat them and live in them. Plants also help to clean water.

5. Watch video explaining parts of the plant to get students prepared for worksheets:

<https://youtu.be/TD6o-3rqPXg>

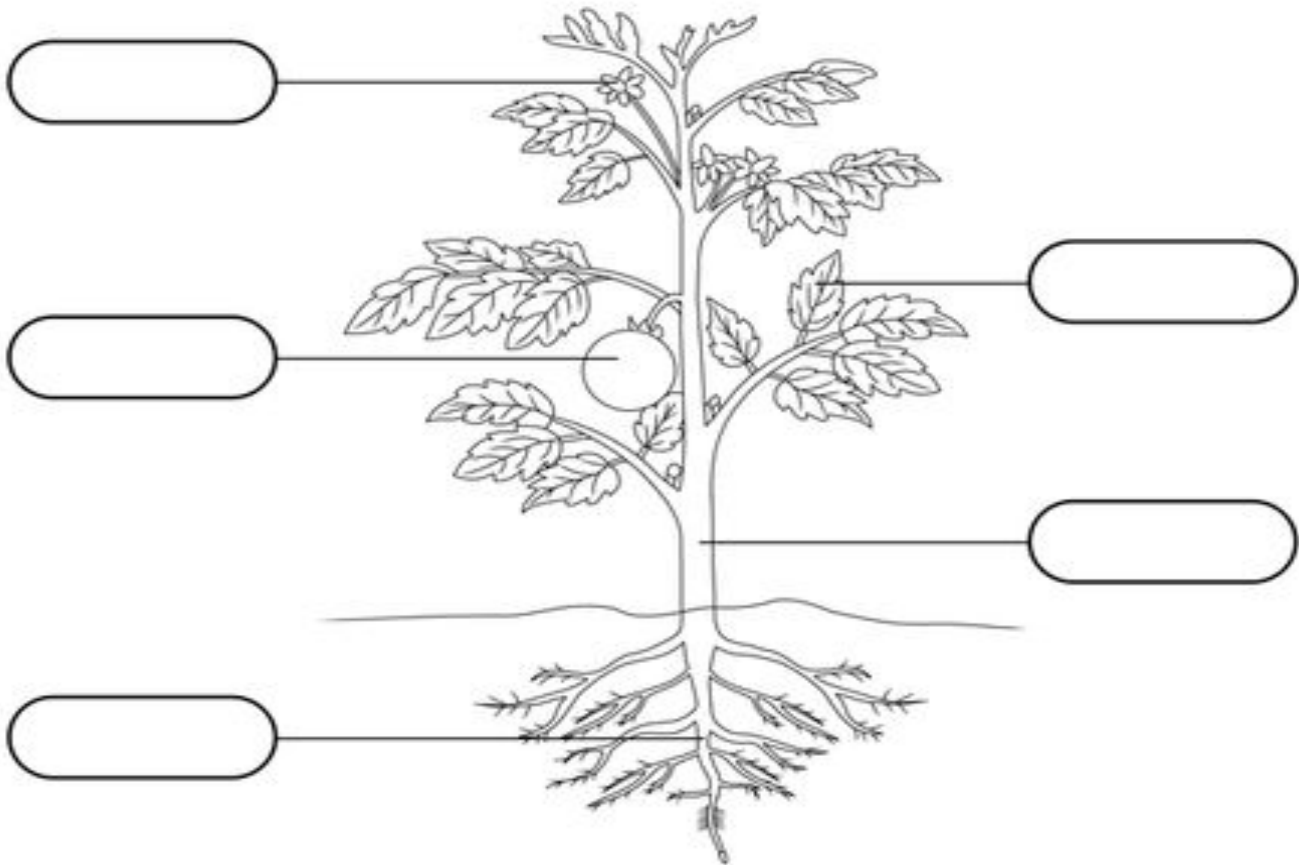
HANDS ON: Review worksheets

6. Hand out the **PARTS OF A PLANT** worksheet and the **LIFE CYCLE OF A PLANT** worksheet (pages 3 and 4).
7. Review worksheets together as a class or have students complete worksheets individually. See answer key on page 5.

Name: _____

Date: _____

Label the Parts of a Plant



Word Box

Flower

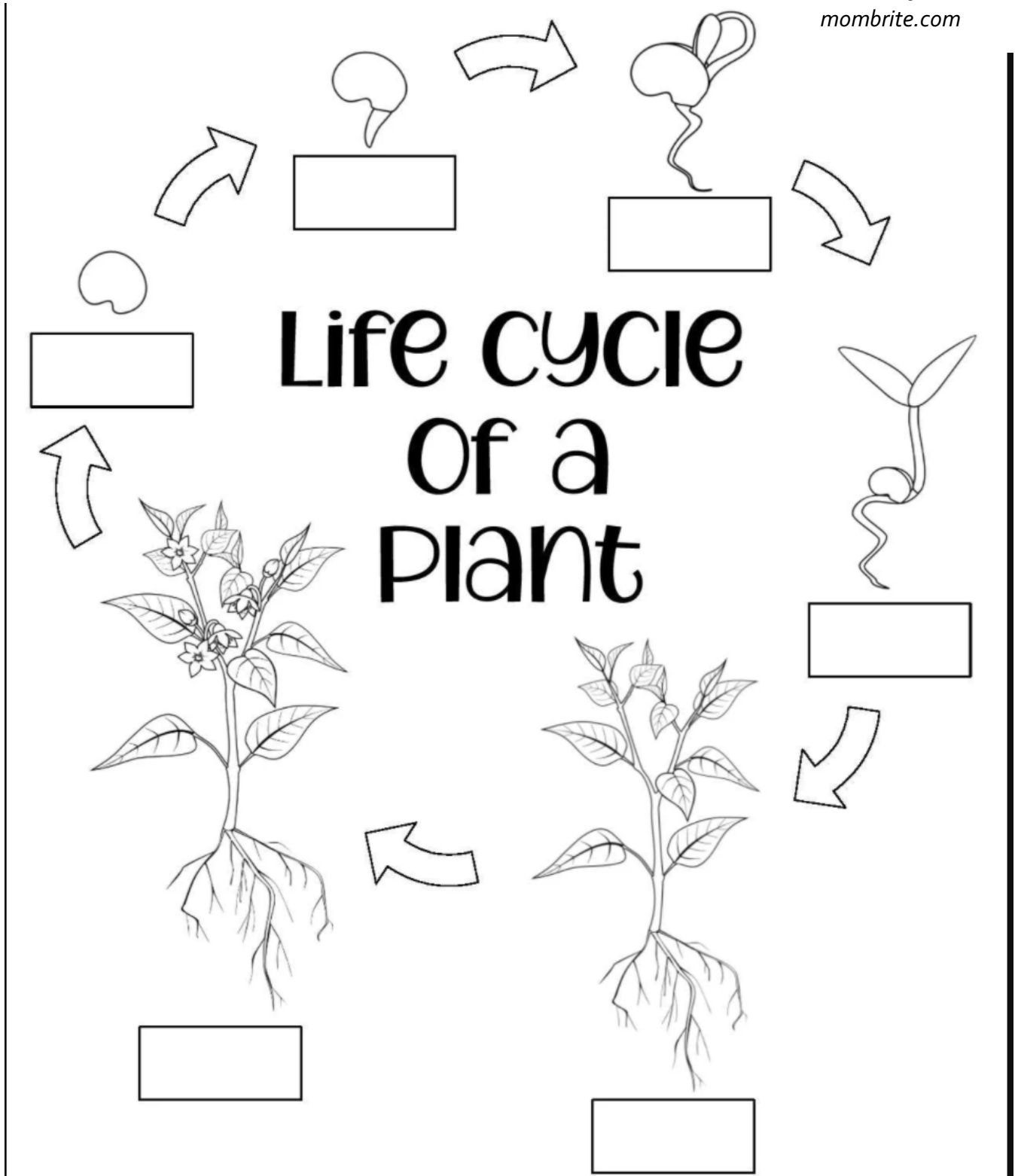
Fruit

Stem

Leaf

Root

Resource from
mombrite.com



| | | | | | |
|----------|--------|-------------|------|--------------------|-------|
| Seedling | Sprout | Germination | Seed | Plant with Flowers | Plant |
|----------|--------|-------------|------|--------------------|-------|

Answer Key

Name: _____ Date: _____

Label the

Parts of a Plant

Flower

Fruit

Roots

Leaf

Stem

Word Box

Flower Fruit

Stem Leaf

Root

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momrise.com

Life cycle Of a Plant

Seed

Germination

Seedling

Sprout

Plant

Plant with Flowers

| | | | | | |
|----------|--------|-------------|------|--------------------|-------|
| Seedling | Sprout | Germination | Seed | Plant with Flowers | Plant |
|----------|--------|-------------|------|--------------------|-------|

| TIME | ACTIVITY | LOCATION | MATERIALS |
|---------|-------------------------|----------|-----------|
| 10 mins | 2. Native Plant Species | Indoor | None |

Native Plant Species

GOAL: Introduce students to native plant species through a simple discussion.

PREPARATION: Gather samples of a variety of common native and non-native plant species.

LESSON PLAN:

1. Ask students if they know what native plant species are? If so, ask them to explain.
Native plant species occur naturally in an environment.
2. Explain that non-native plant species, or invasive species, are species of plants that are introduced by human actions outside their natural past or present distribution. In other words, they do not grow naturally there.
3. Ask students what the benefits of native plant species are? And why are invasive plant species a threat to our environment?
 - i. Students may not know the answers to this question right away, but it is an opportunity for them to brainstorm and think critically.

Possible answers:

- The spread of non-native plant species threatens the environment, economy and society, including human health.
- Native plant species are easy to maintain as they are suited for local soil and weather conditions.
- Native plants help combat climate change by reducing noise pollution, reducing the need for lawn mowers (less CO₂ emissions), and they store more greenhouse gas CO₂ (taking it out of our environment).
- Native plants use less water as they are adapted to local environmental conditions.
- Non-native species or invasive species can take over space necessary for native species to grow by “out-competing”.

4. If possible, have a variety of common native and non-native plant specimens for students to touch, feel, smell, etc.
 - i. Suggested common native species: Sword fern, Salal, Douglas fir, Bigleaf maple, Arbutus, Western red cedar
 - ii. Suggested common invasive species: Daphne, Himalayan blackberry, Broom, Holly

5. In addition, or instead of bringing in plant samples, go through “Sample of Common Native and Non-Native Plants” slideshow available on the same site this booklet was downloaded from (<https://www.mabr.ca/teaching-resources>)
 - i. This slideshow will help students identify plants they see commonly around their community but might not know the name of.

Slides for Exercise 2 of MABR's Biosphere Booklet: Botany

Sample of Common Native and Non-Native Plants

An activity for students to identify commonly seen plants in the MABR, and differentiate between native and non-native species

Sword Fern
Native plant



Broom
Invasive, not native plant

TIME
10 mins

ACTIVITY
3. Traditional Uses of Plants

LOCATION
Indoor

MATERIALS
None

Traditional Uses of Plants

GOAL: Introduce mixtures and their traditional uses to students.

PREPARATION: None.

LESSON PLAN:

1. Ask students what they think of when they hear the word “mixture”.
 - i. Explain that a mixture is a **substance made by mixing other substances together**.
 - ii. Examples: Dirt and water (mud), water and salt (sea water), or combining different plants to make a traditional medicine.
2. Explain to students that plants are often used in mixtures, especially by Canada’s First Nation peoples using traditional methods.
 - i. Native plant species are used to create sacred medicines, supplies, housing, and food. They are important in considering First Nations’ connection to the land.
3. Show students the following video of First Nations Elders Barb Whyte and June Johnson discussing the healing properties of Indigenous plants on Vancouver Island – (Video from Island Health, titled *Indigenous Plant Healing- Island Health Magazine*) <https://www.youtube.com/watch?v=RANcnIOtR1o>
4. Ask students to reflect on why preserving native plant species is important.
 - i. Remind students that each native plant species serves a purpose to First Nations people.



| TIME | ACTIVITY | LOCATION | MATERIALS |
|--------|------------------|----------|--------------------|
| 1 hour | 4. Plant ID Walk | Outdoor | Printed worksheets |

Nature and Plant ID Walk

GOAL: Review topics from discussions and apply learned knowledge through completion of a plant identification walk.

PREPARATION: Print **PLANT ID CHECKLIST** (page 10-14) and choose a location to take students where there is abundant plant life (example: Heritage Forest in Qualicum Beach). If possible, organize a plant expert to provide a guided walk for students.

LESSON PLAN:

1. Review topics with students learned in previous discussions:
 - a. Do they remember what botany is?
 - b. Why is plant life important?
 - c. What is the difference between native plant species and non-native plant species?
 - d. What is a mixture?
2. Take students to an area where they will be able to complete their nature and plant ID walk (page 10-14).
3. As a class, walk around the selected area and identify what plants are there and check them off on the ID list. Students can utilize the pictures and descriptions to confirm they have found each plant species.
 - a. Inform students they should not pick the plants (see note on next page).
 - b. Students may not be able to find every plant species on the list, as available plant species depend on the area selected as well as the season.





Plant ID Checklist



Each item includes a photo, the common name, scientific name, and the traditional name from various Coast Salish communities. If you find a plant that matches the photo and the description, put a checkmark in the box at the top of each photo.

Note: It is important to follow a traditional protocol that pays respect to Mother Earth when harvesting sacred plants; therefore, indiscriminate picking of these plants is disrespectful. Teachings about traditional plants and uses, including traditional protocol, should be guided by local Elders, Knowledge Keepers or Cultural Advisors.

Shrubs



Salal • *Gaultheria Shallon* • DAKE

Description: Its egg-shaped, serrated leaves are shiny and dark green on the upper surface, and rough and lighter green on the lower. Salal has small pinkish or white flowers that produce reddish to blue, spherical fruit.

Traditional use: Traditionally, Indigenous people on the Northwest coast ate the berries fresh or dried them in cakes for later consumption. The plant's leaves can be prepared in a tea to treat coughs, heartburn, bladder inflammation, stomach or duodenal ulcers, and menstrual cramps. The leaves have healing properties, making them useful to treat wounds.



Trailing Blackberry • *Rubus Ursinus* • SQW'IL'MUXW

Description: It is a low, trailing plant with white to pink flowers that produce small blackberry fruits. It is common in dry, open forests from low to middle elevations. It is more common in the southern two-thirds of Vancouver Island.

Traditional use: Fruits were eaten fresh, leaves were used for a medicinal tea for stomach-ache, and roots were used in a tea for diarrhea.



Red Elderberry • *Sambucus racemose* • ʔIWEK

Description: The plant has a reddish-grey or greenish grey bark, and grows between 6 - 12 metres high. The flowers are small and white, with 5 petals. The fruits are small red berries, and the plant does best in sunny, moist locations.

Traditional use: This plant is very rich in Vitamin C. Although any part of this plant can be eaten, it is recommended to cook the berries first as they contain poisons that can cause nausea, vomiting, and diarrhea. The bark and leaves can be used to treat many different illnesses such as toothaches, colds, sore throat, fever, cuts, sores, sprains, bruises, and arthritis. The blossoms are known to be used for treatment of measles and are also edible. The fruit stems and bark can be processed to make a dye.



Salmonberry • *Rubus spectabilis* • ELILE IŁĆ

Description: It has a woody stem covered in fine prickles. The leaves are composed of 3 toothed leaflets. The plant has pink flowers that bloom in April or May, after which they produce a berry that resembles a large shiny yellow to orange-red blackberry.

Traditional use: The leaves were used for a variety of medicinal purposes. Boiled into a tea, they were used to treat diarrhea and to stimulate appetite, while a mixture made from chewed leaves was applied to burns. Indigenous groups on the central BC coast pounded the bark from salmonberry twigs into a pulp that was used to dull toothaches and treat skin infections.



English Holly • *Ilex aquifolium* •

Description: Leaves are dark green on the upper surface and lighter on the underside, oval, leathery, and shiny; they have 3-5 sharp spines on each side of the leaves. The flowers are white, slightly pink, or yellowish and have 4 petals. They produce a red or yellow fruit.

Invasive Species: Holly has been grown for decorations at Christmas time. However, the plant is very invasive, as it grows rapidly to 7 - 10 metres high. This means it casts a deep shade and utilizes a lot of water, competing for necessary resources that native plant species need. Additionally, the life expectancy for English Holly is about 250 years making it a big problem.

Ferns



Deer Fern • *Blechnum Spicant* • HEILTSUK/HAÍŁZAQV

Description: Deer fern is very similar to sword fern, but the leaflets are attached to the leaf axis all along their bases and each leaf has round edges. It is also leathery in texture.

Traditional use: Traditionally, the leaves were chewed on by Hesquiat hunters and travellers as a hunger suppressant. The leaves were also used as a medicine for skin sores. Elders also observed deer rubbing their antler stubs on the plant when they shed their antlers.



Sword Fern • *Polystichum Munitum* • SFXÁLEM

Description: They grow in tight clumps and can reach 50 - 180 cm in height. Each stalk has paired leaves all the way up and each leaf has pointy edges. Looking under the leaf you will see two rows of round spores.

Traditional use: The fronds were used as bedding, and as mats on house floors. Medicinally, Nuu-chah-nulth peoples used the fern to cure diarrhea. It was also used to ease a sore throat and tonsillitis. Additionally, some coastal Nations such as Squamish and Ditidaht used the fern to play a game called "Pala Pala". This game was played by pulling off the leaflets of the fern one by one while saying "Pala" meaning "One" while holding their breath. The game was played by children and also used as a training tool for young men so they could dive down into the ocean to harvest bull kelp.

Trees



Douglas Fir • *Pseudotsuga Menziesii* • SLEYUHP

Description: They are generally 20-100 metres tall. The needles completely encircle the branches. The cones are distinct because of the 3-pointed piece that sticks out above each scale.

Traditional use: The wood was used for fires, fishing hooks, and snowshoes. The branches were used for bedding, and the seeds were eaten. Today, it is often used for heavy-duty construction and building materials.



Arbutus • *Arbutus Menziesii* • KÉKÉIŁĆ

Description: They are known for their red flaking bark and edible red berries. Arbutus flowers are white and bloom in April or May.

Traditional use: The WSANEC peoples used the bark and leaves medicinally to help treat colds and stomach aches. The bark can be infused to treat cuts, wounds, sore throats, and help treat diabetes while the inner bark was used to make dresses.



Big Leaf Maple • *Acer Macrophyllum* • ƧƧÁ, EŁĆ

Description: It has the largest leaves of any maple species, 15-30cm across, and has 5 lobes. The flowers are small and appear greenish yellow in early April.

Traditional use: All parts of this tree were used for medicinal, edible, spiritual, and practical purposes. The bark was made into tea to treat tuberculosis, and the maple sap was mixed to treat sore throats. Leaves were used as containers and for adding flavour when cooking. The spiritual and symbolic powers of the tree involve good health and balance. The hard wood was used for canoe paddles, and the bark was used to make ropes and baskets.



Western Red Cedar • *Thuja Plicata* • XPÉY'

Description: They can reach 65-70 metres (m) in height and have a trunk width of 3-4m. The foliage is green and forms flat sprays with scale-like leaves. The cones are very small, only 10-18mm long and 4-5mm wide, with brown overlapping scales.

Traditional use: Northwest coast Indigenous communities used giant cedar trunks for their canoes, housing materials, tools, and totem poles. The bark was used for everything from rope and basketry to clothing and baby diapers. The smoke from red cedar was favored for smoking salmon.



Pacific Crabapple • *Malus fusca* • KÁ, E. WŁĆ

Description: A small tree or multi-stemmed shrub that grows to 12 metres tall, armed with sharp thorn-like shoots and bearing showy white to pink flowers from mid-April to early June. The apples are yellow to purplish and are tart, but edible.

Traditional use: The fruit of this tree is an important food source for many coastal people. Due to its high acidity, the fruit easily stores for the winter without any processing, although the fruit is often made into jam. The hard wood of the tree has been used to make tools, such as axe handles, halibut hooks, bows, and fishing floats.

Flowers



Skunk Cabbage • *Lysichiton Americanum* • C'AQWA

Description: It has a bright yellow lantern-shaped flower that grows 25cm tall from the base of its large green leaves. The flowers start blooming in March and can remain in bloom until summer. The leaves are usually shiny, bright green, and waxy.

Traditional use: The roots can be steamed and eaten and used for medicine. The leaves can be used for packaging and serving food.

Animal use: Black bears eat the plant in spring as a laxative.



Vanilla leaf • *Achlys triphylla* •

Description: Vanilla leaf is very common and abundant in the area. When dry, it emits a vanilla scent. The leaves are composed of 3 leaflets. The flowers bloom in April until July; they lack petals, instead they grow as long white spikes.

Traditional use: Historically, First Nations peoples have used vanilla leaf as an insect repellent. They dried the leaves and hung them up to keep mosquitos and flies away.



Yarrow • *Achillea millefolium* • TELIK'ELP

Description: Yarrow is a herb, about 30-70 cm tall. It has several stems rising from the main rootstalk and is strongly scented. The leaves are long, silky/hairy and blue-green. The flowers are small and white, although sometimes they are light pink or yellow.

Traditional use: Used to treat many ailments, from colds and bladder ailments to infusions for bathing arthritic limbs, and poultices for sciatica and sore muscles. Chewed leaves can be applied to burns and boils, and made into a chest rub for bronchial infections. Indigenous peoples across Vancouver Island used yarrow to stop bleeding, and it was often taken on hunting trips for this reason.



Pink Fawn Lilly • *Erythronium revolutum* •

Description: It has two wide, flat, mottled green leaves near the ground, with a single stalk growing up from between them. The stalk droops at the tip and 1-2 pink flowers with yellow centres grow from there. The flowers can be found blooming in April.

Traditional use: Several First Nations tribes ate the lily's bulbs. Some ate them on hot days because they are cool and moist inside. It was said if you did not drink water after eating the bulbs, you would get sick.

| TIME | ACTIVITY | LOCATION | MATERIALS |
|---------|---------------|-------------------|-----------|
| 10 mins | 5. Conclusion | Indoor or outdoor | None |

Conclusion

GOAL: Wrap up the lesson and discuss students' highlights.

PREPARATION: Print page 16.

LESSON PLAN:

Ask students the following questions and have them reflect on their experience:

1. What was the most interesting thing they learned during this topic?
2. What is their favourite fact about plants?

Have students draw their favourite plant that they have learned about, and include what they think it needs to grow and live. Space is provided below (page 16).

My Favourite Plant Drawing

Name: _____

Date: _____

Information for scavenger hunt collected from:

Camosun College: Na'tsa'maht Indigenous Plant Garden. Native Plants: Key Tags - ID and Information

<https://legacy.camosun.ca/sustainability/garden/plant-id-2.html>

Biodiversity of the Central Coast: Plant Species Guide

<https://www.centralcoastbiodiversity.org/species-guide.html>

Sierra Club BC: Eco Map <https://sierraclub.bc.ca/ecomap/georgia-depression/>

<https://sierraclub.bc.ca/ecomap/coast-mountains/>

Photos retrieved from open sources



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or email it to the MABR Coordinator at



mandy.hobkirk@viu.ca